The Builder.

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Government and the Evicted Poor.

ONE of the fathers of natural history, when a student at a northern university, was accustomed to enliven his lonely rambles on the seashore by collecting specimens of the *algæ* thrown up by the tide. When the collection had attained some respectable magnitude, and the strange and graceful forms of the then unclassified marine plants had attracted the admiration of the fellow students of the self-taught naturalist, he was encouraged to submit it to the notice of the professor who was the official teacher of natural history. The great man glanced superciliously at the carefully-gathered specimens, and pushed them contemptuously away with the remark, "Pooh, sir, a lot of weeds!" The name of the professor would now only be remembered by virtue of the light reflected from that of the student whom he snubbed, while the "lot of weeds," scientifically arranged, are the subject of many elaborate botanic works, and are favourite objects for the herbarium of the amateur or the tyro botanist.

An anecdote of this nature is of value, not only as enabling us to bring clearly before the imagination the giant strides which the science of natural history has made since the time, and in consequence of the initiative, of Linnæus, but also as serving to show the very different manner in which we are becoming accustomed to regard facts, when compared to the habits of thought common in previous centuries. Inductive knowledge is especially grateful to the practical English mind, and it is a hopeful and striking feature of the present times that we are endeavouring, confusedly perhaps and feebly, but still with a definite purpose, to render the same sort of service which Linnæus performed for the organic, and Cavendish and Dalton for the inorganic, kingdoms to that more recondite and more important branch of science which Aristotle calls politics, and which Comte termed sociology. The proper object of all labour, whether of the brain or of the arm, is to increase the welfare of the human race. The highest, therefore, of all sciences, is necessarily that which unfolds the working of the laws which regulate social life. As all other sciences are subordinate to this master-knowledge, so is this, of necessity the last that we can hope to perfect; but it by no means follows that its foundations cannot be laid broad and deep long before we have a clear perception of the symmetry of the future structure. It is, therefore, a sign of progress when we find the great questions that lie at the root of the national welfare to be removed from the arena of party contest, when we have to record the fact, and to admire the tone of such a discussion as took place the other day between representatives of the Legislature, the philanthropists, and the first minister of the Queen.

Imperfect scientific knowledge is for the most part dogmatic and intolerant in proportion to the narrowness of its range. In science, as in religion, a man must not only have learned much, but must have acquired the habit of regarding a subject from different points of view, before he attains the large and wise tolerance of a truly Catholic spirit. It is therefore in accordance with the whole history of human thought, that when a clear and vigorous thinker attacked that master-science which had made little or no progress since the great Alexandrine era of intelligence, set himself to collect the facts that contemporary knowledge offered, and to reason on the laws that affect the Wealth of Nations, theories that are incontrovertible while confined to their proper object should be stretched by less original minds to an undue extent, so that moneyed riches were confounded with wealth or well-being, and men were led to believe the affairs of the mart to be those of the commonwealth. Those who regard, as so many do, the science of political economy as more than a constituent and minor part of the science of politics are thus in the constant habit of drawing false inferences from true principles, and of confounding skill in buying and selling, in manufacturing and in transmitting, with statesmanlike ability in the government of mankind.

In this confusion of thought among many of the writers and speakers of the day, a confusion not accidental but essential, and which is thus liable to vitiate the whole structure of their argument, we trace one cause of the extreme difficulty which all admit to attend the solution of the question of housing the homeless poor. Questions of very varied nature have to be solved, as it were, by the same operation, and in the absence of that clear scientific grasp that should at once strike out the limits of the subject, deciding how much falls within the province of philanthropy, how much within that of commercial action, how much within that of the duties of the State, there is no room to wonder that we have remained so long paralysed in face of a great and admitted evil, and, what is more, of a great and crying injustice.

The state of things—we do not say which the deputation laid before the Premier, for the Society, to our minds, started on somewhat wrong grounds, and on the occasion in question were not very clear as to what they wanted, but which originated the necessity for both the interviews of the association so respectably represented—is briefly this. Our London poor, the very poor, are homeless, houseless, almost altogether shelterless. Daily their numbers are augmenting; daily the numbers of such poor and unfit abodes as are within their reach is diminishing. While the metropolitan population is doubling itself within forty years, it is stated that public and private enterprise has had the effect, within the last four or five years, of demolishing so many of the poorer dwellings as to thrust some fifty thousand of their former inmates into the scanty room already overcrowded by some four hundred and fifty thousand of their companions. The cases of personal hardship, of injury to health, and to morality, of irresistible and therefore of unjust and wicked stress put upon so large a number of those of our fellow citizens who are just the least able to withstand it, are such as to raise the alarm of all who know them, and that not for the injured half million alone, but for the whole three millions of Londoners. It is not necessary in these pages to dwell on the frightful magnitude of the evil.

The sole question is as to the nature of the remedy or remedies best to be employed. It is of course in this, the therapeutic part of the subject, that the difficulties make their appearance. How is the accommodation so urgently required to be provided? By organised private charity, is one reply. Very noble have already been the efforts of private charity. Very munificent the charity of one honoured name, as to which, though we ought not to regret that it is American, we are at liberty to lament that its princely philanthropy has inspired so little emulation in our own country. But private charity can do little more for the great destitution than the collection of Peter's pence can effect for the chronic and fatal impecuniosity of the Roman revenue. It is a drop in the bucket. "Philanthropic and enterprising persons and associations have succeeded in providing improved dwellings" for how many of the evicted? For ten thousand out of the fifty; that is to say, a number equal to the average increase of the actually evicted poor during eight years! for less than the average natural increase of the half-million ill-lodged poor during a single year. Say that the demolitions now complained of have occupied a term of five years. During that time fifty thousand have been evicted, sixty thousand have been born or have come to the metropolis. A hundred and ten thousand souls have sought for shelter, and philanthropy and enterprise together—generous Englishmen, a noble American, shrewd minor capitalists, and builders anxious for work,—have among them altogether provided shelter for ten thousand. Nor is it beside the mark to inquire how many of these ten thousand lodgings have been appropriated by members of a less needy class.

If we now turn to the political economist for aid, we shall be told that the demand has only to attain a certain urgency to ensure supply; but the rule, golden as it is when wisely applied, here altogether breaks down. The demand = 110—the supply = 10. The equation will not work out. An important element has been left out in stating the sum, and usually is left out in similar arguments. Demand ensures supply when demand and supply are congruous—not otherwise. Take a well-to-do, rent-paying demand, an 8 per cent. return on investment demand, and supply will follow sure enough,—although in this matter of house-building the quality of the supply is not altogether to the taste of the intending tenants. But take a demand which, as in the present case, may represent a 4 or 5 per cent. return for capital, and even that uncertain, and requiring special exertion for its collection, and the supply is not likely to increase. The philanthropist does something; but he does it alone. The commercial man would do all; but it must be made worth his while. Attempt to fuse the two, and you break down altogether. Ensure by wise arrangements an ample return for the capitalist, not exorbitant, but ample, and what do you do then? You provide comfortable dwellings, into which small tradespeople and others, now ill and expensively housed, but forming no part of the half-million, will readily gravitate, and your houseless poor are houseless still.

Again comes the question, what is to be done? and that in a tone too urgent to be considered in our usual English manner,—that is to say, by being left to answer itself. Lord Derby remarked, "The Government could not be looked to to find lodgings for the poor." We will not impugn the general statement, although it is familiar to one so versed in English history as the noble premier, and is tolerably evident to the most casual traveller through our country, that, since the time of Elizabeth, the Government *has* been, to a certain extent, both expected and accustomed to find lodgings for the very poor, and that the same authority that provided the stocks for "masterful beggars" has provided through our country parishes a last refuge for the otherwise homeless.

There is, however, a peculiar feature in the case before us to which we think that attention has not been sufficiently, if at all, directed, and that is the question of direct responsibility. In the happy anomaly of our institutions, we often find much that is clear to the instincts of

Englishmen without being altogether capable of presentation in an acceptable form to an intelligent foreigner. The glorious uncertainty of the law, as typified in what used to be called the palladium of our liberty, trial by jury, is a case in point. Another is to be found in the curious and often highly complex compromise by which legislation and administration are to some extent amalgamated and shared between Parliament and the Cabinet. The invariable tendency of representative assemblies to gather all possible power within their grasp has not been unfelt in the House of Commons. Thus more and more of what is properly the judicial function has been assumed by the two Houses; and when the occasion for a new branch of administration has sprung up, as in the instance of railways, Parliament has readily occupied itself with details into which it was naturally incompetent to enter, instead of deciding on principles, and handing over details to a competent tribunal. Thus our railway system, as we have recently pointed out, has emerged in such a patched and cripp'ed form from the scrambles of Parliamentary committees, as to have cost us two hundred millions sterling in excess,—a tax of 10*l.* a head on every soul in England and Wales, if we leave out Scotland and Ireland,—a wasteful and useless expenditure, equal to adding a fourth to our National Debt.

This, accordingly, is a not unnatural result of a mode of legislation which is just like deputing the appeal duties of the House of Lords to any casual sub-committee of half-a-dozen lay peers, or of debating all the clauses of all the evidence of a divorce Bill after a whip in the House of Commons. It is, therefore, hard, perhaps impossible, to lay the blame on the due shoulders,—to say the Cabinet did this, the House did that; this is due to the Government, this to the voice of the country.

Into questions of this nature neither the 50,000 homeless poor, nor the 450,000 *quasi* homeless poor, nor the 2,500,000 of Londoners pained, perilled, and damaged by the existence in their midst of a daily-increasing nomade population, can be invited or expected to enter; but there is one broad fact patent to them all,—Cabinet, Senate, House of Commons, it is all one to them,—their governors, as a body, have done them this great injustice. Their governors, as a body, have passed, one by one, special laws, empowering other persons for their own, and may be for the public advantage, to turn them out of doors. It is by direct *ad hoc* legislation that officers of the legion whose name is Railway have been armed with artillery powerful enough to destroy, not only their poor dwellings, but even their native constitutional right to hold their English homes as their castles. Who does not remember the glorious burst of oratory with which a great statesman declared that, wind-swept and rainwashed as might be the poor man's home, the King of England dared not enter it if forbidden. That which the majesty of the law respected for so many centuries, public expedience has set aside. The legislators of the country have, by new legislation, unhoused 50,000 Londoners,—poor, ragged, very likely dirty, naked, destitute, but still Englishmen;—they have turned them adrift, *pro bono publico*, by the strong hand: they are bound in right and in conscience to shelter them.

If public attention, in and out of Parliament, be once fixed on the aspect of the case which we now present, a first and a most important step will have been taken towards the removal of the evil. We are at a loss to imagine what arguments can be urged against the truth of our view. As matter of special pleading, indeed, it is easy to produce arguments on either side of any similar question; but the doubt and hesitation which so often will arise in the breast of the conscientious man as to which is really the right side of a case are here, we think, quite excluded. It is a case like that of a trustee, who, with no bad intentions, has neglected his duty, and allowed the funds of his trust to be tampered with. Perhaps he knew nothing about it, and only signed some paper, of the contents of which he was ignorant, and which he was told was a mere formality. Nevertheless, the Law says he must pay; and Justice, in this case, accords with Law. Thus when the Legislature has given power to private companies to unhouse 50,000 helpless poor,—poor who must live, if they live at all, God help them, within a certain area,—and has neglected to insist on due provision being made to supply the want thus created, the Legislature, the careless trustee in this instance, must pay. It has allowed the companies to go scot-free—it must stand in their shoes.

If this be once admitted,—regarded as a national and not as a party question,—as the noble premier most justly puts it, the way out of the difficulty is, to a great extent cleared. We can, in this case, at once provide for the evicted; and, by the time that we have succeeded in so doing, we may have collected information and experience enough to enable us fairly to deal with the whole great question of housing the City poor. What is immediately requisite is, to do for the poorest class at once, somewhat less than private enterprise now annually effects for the enlargement of London. We might, indeed, say very much less, if we regard the nature of the accommodation required, the number of cubic feet per tenant that should be allotted in the new streets and terraces that must replace much of the crumbling, wasteful, ruinous back yards laid open in so many instances by the course of railway demolition. Private enterprise accommodates 75,000 new inhabitants of London, of all classes, per annum; the restitution now demanded by the evicted is that of dwelling accommodation for 50,000 of the very poorest. The cubic space to be occupied by the requisite buildings cannot be the half of that which is annually roofed in by the London builders.

The mode of providing this accommodation will readily suggest itself to those accustomed to deal with public works, so soon as Government or Parliament admits its fair responsibility. Nothing can be simpler. We speak without the authority of any of those beneficent and active friends of the poor who have been, and who will be, at the front when required, but we feel that we can speak in their names with little hesitation. Let Parliament guarantee five per cent. per annum on a certain maximum sum to be expended in providing decent and frugal accommodation for the evicted metropolitan poor, of course with proper stipulations to obtain the right sort of dwelling. Power must also be given to obtain the removal of positively uninhabitable dwellings, and sites for the new ones, by means of such a bill as that brought in by Mr. Torrens, amended, as may be needed, and philanthropy will do the rest. Men will gladly come forward to consecrate their time and their talents to the task, as well as to advance their money, with this one assurance, that they are not to lose it. The organisation familiar to Englishmen for the execution of great works can be at once commenced. The names of an efficient and a trustworthy board of directors can almost be decided on by acclamation. Responsible architects and engineers must be properly engaged. Over the whole expenditure of the association, in purchase of sites, and in building, as well as over the rate and mode of collecting rental, the Government will be bound, in virtue of their contingent responsibility, to exercise just that species of control which will be most useful, so that there shall be no chance of any misappropriation or any sentimental extravagance. *The Poor Man's Home Association*, to which all who would assist the poor man will gladly contribute all the aid they can afford, commanding an adequate capital, expecting no profit, but secured by Government guarantee from losing the ordinary interest on their advances, bringing all that science can effect and that philanthropy can wisely suggest to bear on the removal of that which, if longer neglected, will be a national crime, would raise its head with honest pride among the munificent associated Institutions of London.

THE NEW TOWN OF EDINBURGH: ITS DRAINAGE AND WATER SUPPLY.

WE promised to return to the questions of the drainage and water supply of the New Town of Edinburgh, as affecting its sanitary condition.* Before doing so, however, it may be as well to glance,—and we shall do so very shortly,—at its situation, the variations of climate and temperature, the prevailing winds, and the annual rainfall. It stands, as we have seen, in close proximity to the Frith of Forth, at a considerable elevation. The valley of the Princes-street Gardens is 169 ft. above the level of the sea; George-street is 226 ft. above it, and from this the New Town descends gradually down about 180 ft. to Inverleith-row, where it is about 45 ft. above the sea. It is situated in 55° 57′ north latitude, and 3° 14′ west longitude from Greenwich. The average temperature is 47° Fahrenheit; but the alternations of temperature are very great, having been observed in the same day to vary from 30° to 40°. The annual mean of atmospheric pressure, as indicated by the barometer, is 29·52 in.; and the annual rainfall is 24·33 in. The coldest months are January, February, and March. The mortality is, however, greatest in the months of November and December, when, although the barometric cold is not so great, the city is blown over by piercing east and north-east winds.

With regard to the supply of water, both the old and the new towns are fortunate. Private wells are unknown in the New Town, as indeed they are in the old; and thus the inhabitants are exempted from the evil of the sewage escaping from defective cesspools into them, and so polluting the drinking supply. There are but two public wells in the New Town,—one in the Upper Water of Leith district, and the other in the Calton and Greenside district. There is a number of drinking-fountains chiefly erected by the late Miss Catherine Sinclair, of Ulbster, to whom, by the way, the city is indebted for the numerous wooden benches which are to be seen placed alongside of the various gardens under the grateful shade of trees.* These fountains are of simple action. By pressing a valve stud the water is made to flow into the metal cup, attached to the fountain by a chain, while an ample waste-basin prevents the water from wetting the pavement. Most of these fountains are made of iron, but there are others of granite, a species of well-case with self-acting tap fixed to a wall front; but they are too few in number; nor is it creditable to the town to leave their erection to the generosity of private individuals. Edinburgh appears to be amply supplied with good water from the Crawley and other springs on the Pentland Hills by the Edinburgh Water Company, which was formed in the year 1819. At various times, as the population increased, the company have had to make application to Parliament for powers to acquire new springs. The Crawley springs discharge their waters into a covered cistern, which is 45 ft. long, 15 ft. wide, and 6 ft. deep. Thence they are conveyed to town, a distance of nine miles, by a chain of pipes varying from 20 in. to 15 in. in bore. Towards the town termination of the line the pipe is carried through a tunnel 2,160 ft. in length, and about 80 ft. under the surface of Heriot's Green. Then, as it crosses the Grassmarket, it bifurcates by one branch to a large reservoir on the Castle-hill, and by another 120 ft. beneath the reservoir, right through a tunnel 740 ft. long cut through the rock, of which the ridge leading to the Castle is composed. Branches are laid through all the principal streets. The pipes, the joints of which are spigot and faucet, were tested before being laid down by a pressure equal to a vertical column of 800 ft. of water. The branch leading to the reservoir can deliver into it 253·56 cubic feet of water per minute. In 1843 the company obtained power to bring in the Black Springs and those of Listonshiells and Bavelaw, situated respectively nine, ten, and twelve miles and a half from Edinburgh. In 1847 the Bavelaw and Listonshiells springs, about forty in number, were made available by being conveyed in clay pipes into a stone cistern at Westrigg, distant twelve miles from town. They are thence conveyed for nearly five miles through an aqueduct to Torphin

* Vol. xxiv., p. 518.

* It is intended at once to proceed with the erection of a memorial of that lady. The monument, which is to be placed at the junction of North Charlotte-street and St. Colme-street, will resemble in design some of the old English market crosses, such as those of Winchester and Leighton Buzzard, or those erected *in memoriam* of Queen Eleanor. The structure, which will be placed above a flight of three steps, will consist of a basement and two superincumbent stories, and will attain a height of about 60 ft. The basement, which is octagonal in plan, and 25 ft. in diameter, will have its eight compartments separated from one another by buttresses, which, divided into stages by set-offs and ornamented by projecting gurgoyles in the shape of grotesque animals, will terminate in pinnacles enriched by crockets and finials. Each compartment will contain a semicircular canopied niche, surmounted by a high triangular pediment with crockets and finial. The niches will be occupied by statues, placed on pedestals resting on elaborately carved brackets or corbels, which in their turn will be supported by shafts. A gallery, protected by a parapet pierced by flamboyant tracery, runs round the top of the basement, and is broken by the heads of the buttresses and of the pediments. Within this parapet the first story will be carried up octagonal, and will resemble the basement, except that there will be no buttresses, and that the niches will be empty. The second story, diminishing in size, will be similar, and will be terminated by a massive crocketed pinnacle, surmounted by a finial and the figure of an angel with outspread wings. The architect is Mr. David Bryce.

Hill, and from that to Edinburgh by an iron pipe, with an internal diameter of 16 in. These works were designed by Messrs. Rendel & Beardmore, of London, and carried out under the superintendence of Mr. Leslie, C.E., of Edinburgh. The total storage of water in the company's reservoirs at Loganlea, Clubbiedean, Torduff, Glencorse, and Bonally is 109,619,786 cubic feet. These reservoirs alone can supply 350 cubic feet of water per minute for a period of four months without rain.

In 1863 the total sum expended by the company amounted to 485,937*l.* 5s. 1d., and the daily supply of water amounted to 31·12 gallons for each inhabitant. By their Amendment Act, passed in the same year, they obtained powers to raise 46,000*l.* for the purchase of new springs, &c., and it has been calculated that when these have been added the daily supply will reach 39 gallons.

The Lord Provost, magistrates, and council of the burgh and city have adopted various clauses of "The General Police and Improvement (Scotland) Act, 1862," by one of which it is made compulsory on all proprietors of houses to introduce water into them, and the writer believes that this provision has been generally enforced. The water-rates are 10d. per pound on four-fifths of the actual rent or value of houses above ten pounds; 4s. on houses under five pounds; and 3d. per pound on four-fifths of the rental on shops.

The supply of water has contributed much to the comfort and health of the population by enabling them to have baths and other conveniences easily and cheaply.

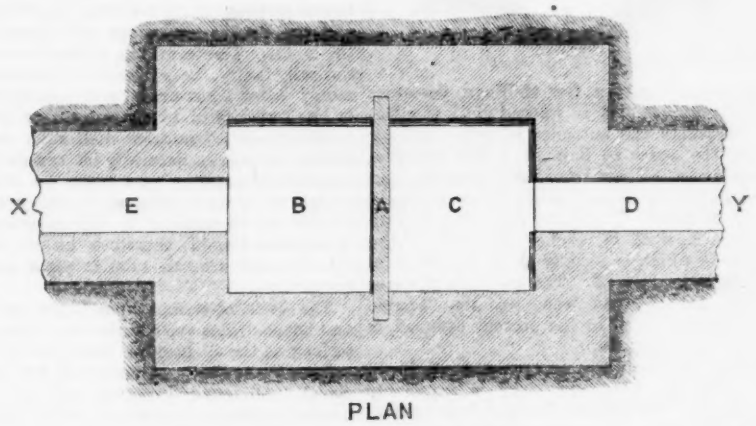
It is believed that, situated as it is on high ground, and at no great distance from the sea, Edinburgh may be readily relieved of its surface waters and the washings of its streets, as well as of its sullage (by which is to be understood its cloacal matter and washing and kitchen waste) by a single system of sewers, and such is the system there in use. Each street is provided with a main sewer, into which the sullage is carried by a branch drain leading from each tenement, while the surface-waters and washings of the streets are conveyed into it by gutterways lying between the foot-pavement and the causeway. The main sewers, which drain the western portion of the New Town, have hitherto discharged their contents into the Water of Leith, converting into a great festering open sewer what many persons remember as a pure, unpolluted stream, abounding in speckled trout. The horrors of this crying nuisance have been so often exposed in the pages of the *Builder* that it is unnecessary here to make more than this passing allusion to the subject, the more so as the Water of Leith Drainage Works, which are expected to remedy the existing state of matters, will, in all probability, be completed in a very few months. These works consist of a main conduit and ten branches, and extend from Colt Bridge to the Black Rocks in the Frith of Forth, a distance of about five miles and a quarter. They commence at Colt Bridge with a brick culvert or tunnel 4 ft. high and 2 ft. 8 in. wide, which is carried through below the Colt Bridge-road to the Colt Bridge dam. From that point to the Caledonian Railway viaduct, the sewer consists of a 2 feet cast-iron pipe, placed in the bed of the river. From the viaduct to opposite Donaldson's Hospital, it is again a culvert of the same dimensions as above. From the hospital down to Canonmills Bridge, for the most part the great sewer, which is placed in the bed of the river consists of cast-iron pipes, varying in diameter from 2 ft. to 2 ft. 9 inches. Between Stockbridge and Malta Green Ford, there is a pipe on either side of the river, the one on the north side, a 12-inch pipe, being intended to intercept the Deanhaugh drain, and the other drains on that side of the stream. From Canonmills Bridge to below Bonnington dam, a brick culvert, 4½ ft. high by 3 ft. wide, is substituted for the iron pipe. Down to this point the great sewer is entirely finished, as are nearly all the lateral drains connected with it. Between the dam and the new Sugar-house at Bonnington, the works are in active progress, and from the Sugar-house down to the Old Town, at the shore of Leith, they are completed. Along the shore the sewer is constructed of iron pipes, 3 ft. 6 in. in bore, while above that there is a culvert, 5 ft. 3 in. in height, and 3 ft. 6 in. wide. The great sewer crosses Leith sands, and up to Tower-street consists of iron pipes of the same dimensions as those along the shore. The pipes, which cross the sands, lie upon a framework of green-hearted timber. The culverts, so far as they have been completed, are already in use at the Water of Leith village, Stockbridge, Canonmills, and the shore, and the sewage at these places is no longer discharged into the channel of the river. The works for the drainage of the mill-lade, at present a highly dangerous nuisance, have not been commenced as yet. They will be of a very light description, and will not occupy any length of time. They will commence near St. Bernard's Bridge, and terminate at the old ford below Warriston Cemetery. The Messrs. Stevenson are the engineers, and Mr. T. C. Hunter, the contractor.

The works will supply drainage for a population of 80,000. The expenses will be defrayed by an assessment of 2s. 6d. per pound imposed upon the proprietors of the Water of Leith district. The Act of Parliament also allows a charge ultimately to be imposed for their maintenance.

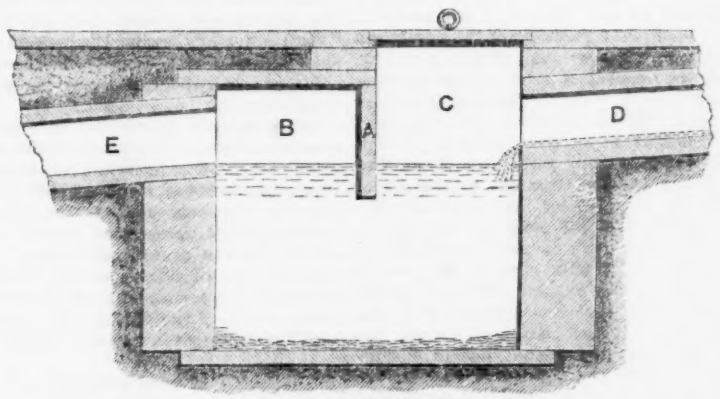
While it is to be regretted that so much valuable sewage should be thus thrown into the sea instead of being turned to account, we must congratulate the citizens of Edinburgh upon their riddance of the Water of Leith nuisance. We cannot doubt that the medical officer of health's report for next year, should other necessary ameliorations take place, will show a great diminution in disease and mortality in the upper and lower districts of Water of Leith, of Cannonmills, Bonnington, and the shore at Leith.

The north-eastern portion of the New Town is drained by a sewer, which, terminating at London-street in a canal, flows past Gayfield-square, and finally falls into the Water of Leith above the harbour. The sewage of the houses on the Calton Hall and vicinity is carried to Leith in ditches between the London-road and Leith-walk, chiefly covered in. The contents of all these sewers, except those falling directly into the Water of Leith, are used in irrigation. Nearly 1,000 acres of land in all are so irrigated in the vicinity of the city, the grass raised on them letting annually for from 25*l.* to 50*l.* an acre. It has been confidently asserted that this sewage irrigation of meadows is not prejudicial to the health of the city. "One conclusion then alone admits of being drawn from the facts collected," says Dr. Strang,* and that is that the irrigation of meadows with the sewer-water from a town does not appear in this climate to engender malaria, nor act in any appreciably hurtful manner on the health of the human beings inhabiting their neighbourhood." It may be so, and Dr. Strang's opinion is entitled to much weight; but we confess to being very sceptical on the subject, especially when we reflect on the two following facts. In 1849, the village of Restalrig, which is situated in the midst of the celebrated Craigentinny meadows, was more than decimated by cholera. The returns gave the large proportion of one attacked out of every five, and one death out of every nine of the population! And within the last twelve months the Army and Medical Commission have condemned Piershill Barracks as the most unhealthy in Scotland; in consequence of which the headquarters of the cavalry will be removed to Hamilton.

In connexion with the branch drain which leads from each house to the street sewer, there is generally a cesspool placed in the front sunk area. The superintendent of streets and buildings, in a recent report, stated that it might be taken for granted that all the houses in the New Town erected before the year 1854, as well as many built since that time, have each a cesspool These cesspools have proved a prolific cause of discomfort and disease. Here it is necessary to observe that an Edinburgh cesspool is a very different thing from what goes under the same name in England, which is either a covered receptacle for sewage, unconnected with any drain, or an uncovered receptacle for ashes, in connexion with a privy. The accompanying plan and section will enable the reader to understand the construction of one of these Edinburgh cesspools, which, we may mention, cost from 3*l.* 10s. to 5*l.* 10s. A pit, B C, 7 ft. 4 in. long by 5 ft. wide and 5 ft. deep, is dug in the course of the branch-drain or house-sewer, D E, which runs along the ground-floor of the house, and joins the street-sewer. The cesspool is laid with pavement, and its walls are made with rough masonry, often of the "shivers" or chips struck off by the mason in shaping his stones. Across the cesspool, and resting on its side-walls, a tongue, A, descends about midway, somewhat beneath the lower edge of the house-sewer D. An opening is carried up at C, covered with a square flag, with a ring attached. This admits of the cesspool being inspected and cleaned. The cesspool, of course, fills up to the level of the drain E, by which the overflow is discharged into the street-sewer. The tongue A thus separates the air on the side of the street from



PLAN

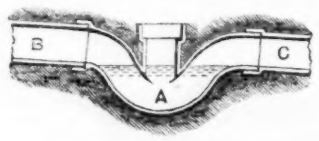


SECTION. X.Y.

* "Inquiry into some Points of the Sanitary State of Edinburgh." By James Stark, M.D.

that on the side of the house. It further serves the purpose of preventing rats from finding their way into the house from the street-sewer.

Into these cesspools are discharged the ejecta from the waterclosets and the kitchen and washing waste. As we have said, they are a constant source of discomfort and disease. The first evil attending them is a *very apparent* one. The solid matter of the sullage carried from the house into the cesspool is of course deposited, and each time that water passes into it the whole of the seething putrescent mass in the division C is disturbed, evolving sulphuretted hydrogen and other noxious gases, which find their way into the house by the drain D. If we consider that the compartment C has an evaporating surface of nearly 7 square feet, we may form some idea of the extent of these fœtid emanations. Although there is a very simple and cheap remedy for this state of matters, it has been only very sparingly employed as yet. A syphon pipe, like that shown in the woodcut,



and which only costs a few shillings, possesses these advantages. It is water-tight; it effectually prevents the entrance of rats; and by allowing the water to flow for a few minutes, it prevents the sullage from being arrested long enough either to deposit sediment or to throw off noxious gases. The water gradually fills up the space A, until it reaches the level of the outlet at C, which is usually about 2 in. or 3 in. lower than the inlet B. The quantity of water retained, although somewhat less than 3 cubic feet, instead of 37, as in the present cesspool, is sufficient to form a trap.

Further, cesspools are seldom water-tight, in which case the basement story is invariably found damp. The green moss and fungi, which are so often found on the area walls and round the edges of the flagstones, are in nine cases out of ten caused by the leakage of the cesspool. Stringent as are the regulations of the Edinburgh Police Acts, to which we shall advert by-and-by, regarding the removal of ashes and solid refuse from the houses, it is to be regretted that there is none requiring the periodical cleaning out of those receptacles of all abominations. Will it be credited that in many parts, even of the New Town, such a cesspool common to the six or eight flats of a tenement, and receiving the discharges from the soil-pipes of as many or more families, frequently remains uncleaned for several years? Yet that such is the case is attested both by the medical officer of health for the city, and by the superintendent of streets and buildings. In self-contained houses this happens comparatively seldom, but in a tenement of flats, where the expense of cleaning the cesspool, which is considerable, is distributed among the different proprietors or tenants, the latter of whom are continually changing their place of abode, it is difficult to obtain the necessary consent of all the parties. Before this has been done and a thorough cleansing effected, "each house," we quote Dr. Littlejohn, "has been filled with emanations from the sewers. The windows have been kept open in order to dilute the nauseous smell: and although the object is partially effected, the sewage gases are sucked into the house in greater volume, on account of the draught which has been occasioned. It is not to be wondered at, if, under such circumstances, ill-health, in varying degrees of intensity, should be the result, requiring, it may be, little medical attendance, but causing great discomfort. Should epidemic disease of any kind affect the inmates, the illness is intensified, and the ailment may assume a character of malignancy, which can only be accounted for by the faulty sanitary state of the house. But it must be remembered, that the air in the street also becomes tainted. A cesspool filled to overflowing, and leaking, can be recognised in the street by its odour. It is placed in the area, and of course the emanations escape in all directions. It is urged as an amelioration of the nuisance, that a survey should be made of all the cesspools in the city, that a register be kept of them, and that the city engineer be instructed to have them inspected from time to time; and enforce the regulation that every cesspool within the municipal boundary be cleaned out at least once a year."*

The remedy proposed would abate the evil, but there would still remain the nuisance of the intolerable stench, which is caused by the existing method of emptying cesspools. Cases have occurred where the men employed in doing so have been afflicted with temporary blindness by the ammoniacal vapours given off. If they must be retained, the plan adopted in the City of New York might be considered. Attached to an air-tight cylinder, which has its air exhausted, is a large leathern hose. The hose is lowered down into the cesspool, when, on opening a valve, the whole sullage, solid and liquid, is quickly forced into the cylinder by the atmospheric pressure. The hose is then drawn up and coiled into its barrel, which is filled with disinfecting fluid. The New York cesspools are provided with a lid or cover, which is tightly keyed down, and which is removed at night when the cylinder is brought round at stated periods. The only proper remedy is to get rid of the cesspools altogether.

Still further mischief arises from the imperfect construction of the house sewer or drain. Made in most cases of shivers, it allows the drainage to escape through its crevices in all directions, and the fœtid exhalations find their way into the house. The form, too, of the house-drain is radically faulty. It is a large square drain, commonly called a box-drain, and permits a greater or less quantity of black putrescent filth to accumulate in its interior with such deleterious results as might naturally be expected. It is impossible in any private house to command a stream of water sufficient to carry away the deposit which collects in this manner. These box-drains should therefore be at once got rid of, and smooth tubular pipes should be substituted.

The evils attendant upon defective cesspools and house-drains are clamant for a remedy; but so long as the authorities have not the power to enforce it,—so long as landlords are apathetic, selfish, and money-grasping, and so long as the general public is ignorant of the real and serious extent of the evil, little will be done. The Local Police Act, 11 & 12 Vict., cap. 113, sec. 190, does indeed provide that any person, who "shall suffer any cesspool to become stagnant," shall be liable to a penalty not exceeding forty shillings; but the enactment is practically a dead letter.

In too many instances the main drains of the streets have been constructed on the same faulty principles as the house-drains, being built of rough fragments of stone roughly cemented together. The consequence is, that the sewage is arrested in its onward flow by the ragged and uneven surface over which it has to pass, and oozes out on all sides, soaking the ground and polluting the atmosphere, while admittance is given to rats. From all this it frequently results that the street gives way and falls in.†

* "Report on the Sanitary Condition of the City of Edinburgh." By Henry D. Littlejohn, M.D., Medical Officer of Health for the City, p. 103.

† To be continued.

THE DESIGNS FOR THE NEW NATIONAL GALLERY.‡

HAVING last week made our readers acquainted with the conditions,—or so far as by the Government they were set forth,—of the problem comprised in the alternative projects for the National Gallery reconstruction or rebuilding, we are now in a position to invite attention to detailed particulars of some of the designs. To such particulars we must mainly confine ourselves at present: for, examination should precede judgment; and such examination, if the judgment is to be of value, must necessarily be of a deliberate and painstaking sort. The ten or other number of competing designs, in any case, are like the same number of books on a given subject; which, to be critically estimated, must have been read. It may not require so much time to read a design as to read a book: but, there is this difficulty for the untrained observer, that nothing is completely represented on any single sheet; or, so to speak, the nouns are on one page, the verbs on another, and the adjectives on a third. Thus, there are impediments to examination of architectural drawings in an exhibition; which the general public, who cannot be said to attempt the examination, and who would be incompetent for it, have no idea of; and which even the competent men, professional architects, habitually disregard, ignore, or forget. An opinion expressed merely from the examination of a perspective-view, cannot be conclusive, even as to the decorative part of an architectural production; and, of course, it leaves entirely untouched the question of the suitableness of the design to the uses of the building, that question which must be responded to before the effect shown in the drawing can be deemed possible of execution,—unless by a negation of the special art, architecture.

As it is, opinions are freely pronounced condemnatory of the whole number of the designs in their decorative character; and so much so is this the case, that "Wilkins's design" is said to be the best. We alluded in our last article to the fact that there were merits in the present structure. But any conclusions formed without examination of the geometrical drawings,—those which really, and alone entirely, have in themselves the materials for the formation of a judgment of the appearance of the building when erected, must be worthless, and should especially be steered clear of by architects, whose art and profession both are so much misunderstood through the erroneous manner, on the part of the public, of looking at drawings.

It may be that this competition repeats the experience of previous cases, in merely affording hints, without supplying the exact design that should be adopted in building. There is certainly (we say so, after much careful examination), less evidence of *art* in the designs, than the profession should have presented; and even the questions of arrangement and lighting are not conclusively solved in conjunction with the production of good decorative character. Of one or two of the competitors it may be said that they have expended a liberal sum out of the 200*l.* of each, on the mounting and getting-up of drawings; whilst money would have been better earned by a devotion of their personal study of the subject and their originative thought. We must, however, refer to what we said in our last, as to the "Instructions." Architects call out for instructions; whilst the need is at most of suggestions. In the present case, arrangement and lighting of the pictures should have been mentioned along with whatever might be the views of such men as Mr. Wornum and Mr. Redgrave. Instead of this, we are constrained to believe that the "Instructions" have in one way or another run counter to both those authorities, without leaving the competitors room to choose or think. We differ from the conclusions to which Mr. Thos. Fairbairn arrived in his letter this week in the newspapers, as to the essential superiority, for pictures of every size, of the wide, lofty galleries of the 1862 Exhibition and the Manchester Art-Treasures Exhibition; though, also we by no means agree with him that there was superabundance of light in 1862 on the frequent rainy days, whether of the summer of that year, or of the approaching winter. Extent of wall-surface, which may be somewhat increased by lessening dimensions of width to 42 ft. at most, is one consideration for a National Gallery; whilst another, not mentioned, and tending, it might be said, the other way, or against small rooms in public galleries and museums, is that such rooms would not permit of required supervision of certain classes of visitors to the Gallery. But as to side-lighting, set down in the "Instructions" as admissible for cabinet-pictures and drawings, there is much to be said in deduction from the advantages which it might give for planning the building generally. The wall in which the window is, is worthless for hanging pictures upon, and had best be given to the largest area of opening. The wall opposite the window is a bad place, for small pictures more than any others; because the spectator's head will be apt to cast a shadow upon the pictures. On the sides of the rooms, or recesses, the pictures are not lighted as they should be; and the shadows of the frames have to be considered: whilst there is a necessary deduction for the doors of entrance and exit. These disadvantages were very clearly exemplified at South Kensington on the recent occasion of the Exhibition of Portraits. The conclusion is obvious, that no one of these points of planning and arrangement of the galleries, should have been named either dictatingly, or as though it would be a thing likely to meet with approval. An architect deserving to be selected to compete, and to be paid 200*l.*, should have been credited with power of selection and judgment as to data that might have been offered him.

‡ See p. 23, *ante*.

Whatever the results of this competition, however, we would by no means revert to the system of unlimited competitions. The public will not readily learn that these latter competitions defeat their object: but no one with an architect's experience could often advise them.

With all the improvement as to arrangement of the drawings, and space provided for them, that the exhibition of the National Gallery designs affords, there is one capital omission in it. It is, indeed, generally made in such exhibitions. The plan of the ground, documents, and "Instructions," which were the basis for the competitors' labours, are not to be seen.

In noticing the designs, we shall not place them with reference in any way to merit. Accident in this case seems to have determined the order in which they are disposed, and are generally examined by visitors.

Mr. Owen Jones's design made in response to the demand for a project involving "no costly alterations" in the "existing building," and which he distinguishes as Design B, contemplates no change in the present building, but of course appropriates the new ground, or what is occupied by the workhouse and the premises east of it, and by the passage at the back of the Royal Academy. In planning the additional buildings he has observed the same distribution as in his design A, to which then it may be sufficient to confine description. Mr. Jones believes that it will be impossible to add to, or improve, the present building, so as to produce a satisfactory result; and he makes this remark:—"It is as difficult for one architect to alter the work of another as to forge handwriting; and if the building is to remain, it had better, he thinks, remain as it is—a record of the state of the art of architecture at the time of its erection,"—an excellent remark,—though there has been an architect, Sir Charles Barry, who was particularly successful in altering the work of others, and yet leaving the mark of his own hand distinctly.

Mr. Jones's chief design (A) deals with the whole of the ground, inclusive of the site of the barracks as well as of the workhouse and present National Gallery; which last he would remove, and erect a new frontage of buildings of entirely different character, and set back considerably. Viewing the complete plan, it is distinguished for its extreme rectangularity. In several of the designs, the eastward projection of the new ground, in St. Martin's-place, has led to an obliquity of the line, on that side, with the line of present frontage, and to angles which are more or less acute, unless where the angle is rounded off. Again, Hemming's-row and its continuation, Orange-street, not being parallel with the frontage, but tending somewhat northward, and a line of frontage being carried along that side, the north-west angle of the plan as intended when the barracks are removed, is made acute. But Mr. Jones has no frontage taking the line of Hemming's-row: his rearward line would be parallel with that of the main front and of the Square. The two lines would be intersected by three others, leaving ground for two large internal courts. The southern ends of these lines of the plan become centre- and end-pavilions of the Trafalgar-square front; whilst the northern ends differ from one another in projection, according to the rake of the ground. The only deviation from this rectangularity, is as regards a portion of the building which occupies part of the eastward projection next St. Martin's-place. This portion is semicircular on plan, and incloses its own court. Thus, in the building, there would be that simplicity of distribution of the galleries which would be important for the easy circulation of crowds. The entrance would be as required by the "Instructions," namely as at present; and there also would be the way of exit. Visitors would enter a grand circular hall, from a wide porch or projecting loggia of arches, ascended by steps, and would have in face of them the staircase, and, right and left, galleries of the ground-floor. This circular hall has a balcony round it, carried by columns, and has a vault after the manner of that of the Pantheon, at Rome, as regards the lighting, but with the coffered ornamentation disposed on diagonal lines, somewhat after the method adopted by Mr. Jones in several of his recent works. From this hall, or rotunda, the visitors, having turned to the left, would make the entire circuit of the building: from the hall again, they would ascend the stairs: from the top-landing of these they would pass south to the gallery round the hall: thence they would pass westward, to make the circuit as before. The principal gallery would be 300 ft. in length by 51 ft. 6 in. in width; and an arched ceiling is shown, with a light in the centre, and effective ornamentation. The longest projecting block, on the north, 95 ft. by 51 ft. 6 in., would be devoted to purposes other than the exhibition of pictures. In the central projection towards Hemming's-row, would be the keeper's residence. It may be well to mention, referring to what was said some time since respecting the provision of a residence in the present structure, that the keeper is required to reside in the building. As to the amount of provision in the designs now at Westminster, it varies considerably. We do not quite make out that in the design before us, the provision is adequate. Near to the residence in this design, is the unpacking yard; and it is considered that the keeper would command the galleries, as well as supervise the matters of business requiring his attention. The re-entering angles of the two chief courts are filled with little blocks of building, containing rooms for police, attendants, and the service generally. Side-lighting is of course the principle, in this design, for the entire ground-floor: it also obtains in the second story or first floor, for the south and east fronts of the building, or for drawings and cabinet-pictures, to be "placed on screens at right angles to the windows," Mr. Jones says, "as they were in the National Portrait Gallery at South Kensington." He adds that this method "admits of increasing the hanging-space as the collection may require it." If the *increase* be meant as contrasted with what might be got in top-lighted galleries, we think we should hardly admit the force of the observation. The piers of the building are narrow, and the openings wide: the former are 15 ft. from centre to centre; which, therefore would be the distance of the screens. The side-lighting allowed by the "Instructions" has furnished "the key-note" of the design. Mr. Jones expresses as his opinion, that "a façade without windows would be like the human face without eyes, and be void of all expression." We think this the wrong way of reasoning in matters architectural, and a way that Mr. Jones, judging from what he has written, would not have followed excepting by an inadvertent subjection of himself to the ever-troubling "Instructions." The first question for the competitor's decision was, or ought to have been,—what is the best, or the sufficient, mode of lighting? It might be that Mr. Jones would have replied, as he seems disposed to do, side-lighting, considering what are other conditions of the planning; but, had he felt obliged to say with some others, top-lighting, we hardly think that he would have therefore made a bad building. Surely, a building may be without windows, and yet not void of expression. Indeed, are there not old styles in which the window plays hardly any part,—the Greek, for instance? Though, we should not deduce from that, that a picture-gallery must necessarily be columnar. Mr. Jones knows how many ways there are of decorating a wall: even Soane's attempts, dispensing with windows, at the Bank of England, would show that something may be done without them. Or if top-lights there would be, might they not be made to contribute to the external decorative character? The character as it is in Mr. Jones's design, may be called a variation of Italian; but, as usual in productions possessing originality and art-character, the decorative expression and details of this design cannot easily be stated in words. There are seven major divisions in the length of the front, including the ends. Three are pavilions: each of these, with each of the two recesses next the centre, has its own roof hipped at the ends, — the central pavilion, however, having the roof-covering, of the rotunda, circular on plan. The centre, in the highest part, is made just the same as the loftiest feature in the present building. All these roofs being about the same height, there is defective grouping; which was never the result from their prototypes, the French roofs. The character of the front is mainly resultant from the details; but general features not described, of the designs, are a podium-base, two stories of modified orders,—the lower order being of panelled pilasters, and the upper one of columns clustered with pilasters, and the group having somewhat elongated shafts,—and an attic filled in with large panels for sculpture, whilst the piers between are terminated by anthemions. In the interpilasters of the lower story, the windows are square-headed, and have moulded and enriched splays, and sills which are carried by a peculiar feature including two bracket-forms placed parallel with the wall-line, instead of projecting from it. The windows of the upper story have sub-arches, carried by an elongated baluster-mullion in the centre. There is much good ornament in the panels of the pilasters, and in the friezes of both orders, especially where anthemions are introduced. It is right to say that the different intimations from the Office of Works as regards the drawings, such as that none of the perspective-views should be in colour, that no drawings to a larger scale than 16 ft. to an inch would be received, and that the elevations were to be in line only, or etched with Indian ink, but not tinted,—disregarded, one or more of them, by some of the competitors,—have all been attended to in the design that we are examining. Mr. Jones's particulars, however, state that he would use terra-cotta, of varied colour, and some coloured marble, in the south and east fronts. One journal has stated that the upper windows in this design were blanks. It will be understood that this was an error. Mr. Jones's approximate estimate for design B, is 95,500*l*. That for design A, taking in the ground of the barracks, is 375,000*l*.

Mr. C. Brodrick's drawings, which come next, comprise three designs, Nos. 1, 2, and 3. They display considerable ingenuity in planning; and for the chief design a somewhat imposing effect of columnar architecture. Design No. 1 would preserve the present building, only making the staircase with the opposite flights. The buildings would form three sides of a courtyard, of over 150 ft. each way, the south side being formed by the half of the building now in the occupation of the Royal Academy. In this yard there seems to be lost space. The eastern range of building, transverse, is not at right angles, but askew with the main front. From this eastward range there is a large semicircular projection; that is to say, it is similar in position to the semicircular projection on plan in the design last described. But there is here no court. The semicircle and that part of the line to which it is attached, are arranged somewhat ingeniously, for side-lighting. The divisions, or screens, in the semicircle, radiate from the centre, or rather from a small semicircle about the centre. This latter curve, on the inner side, is filled in with niches; and being enriched with columns, it would, properly treated, form a very pleasing feature in the plan; whilst as to the divisions of the larger space, the radiating arrangement would mitigate greatly the short-comings of side-lighting. The space not in the semicircle or apsis is divided in the ordinary way. The north gallery, following the line of Hemming's-row, would be 280 ft. in length and 50 ft. in breadth. As designed, the internal effect of this gallery would be highly satisfactory. The divisions of the length are formed by arches and side-openings, the arches carried by columns, and the spandrels enriched. These features carry an entablature, continued from that of the room. From this latter rises an arched ceiling; which has an opening for light in the centre. Both the general features and the ornamentation resemble, in some measure, what may be seen at the Louvre and Versailles.

The design No. 2 includes the site of the barracks; whilst as to the ground, bounded by Hemming's-row and St. Martin's-place, the plan corresponds with what we have described: in effect, there are two large courtyards, instead of one,—the western one, of course, being the larger. But as regards the site of the present building, or rather building itself, the treatment is important, both as regards what would be built and what would be left; for, in the latter category there is much. Thus, whilst the decorative character of the building would be entirely changed, though still kept columnar,—or rather, made markedly so, by a profusion of added columns,—the present exhibition-rooms, which we have taken care to inform our readers are liked by Mr. Wornum, (or, at any rate, three of them at each end of the building) would remain unaltered. A new staircase-hall, of large dimensions, would be added in the centre; and in advance of it, there would be a recessed portico, of fourteen columns between antæ, in the front, and of eight internal columns, placed two together, or dividing the length into five spaces of three intercolumns each. This portico has a flight of steps in front. The order, Corinthian, is continued, or with six columns

on each side, to the ends of the building, where there are quadrants, each formed with two columns in the space. The centre-portico has no pediment; but ten of its columns, in the front, carry the same number of columns of the front of a temple-formed attic-building, which has eleven columns on each side, and of which what we may call the *naos* or *cella* is the upper part of the staircase-hall. This attic-building has a pediment, of which the tympanum is charged with sculpture. There is an attic, or balustrade, to the order of the wings; and the piers, corresponding with antæ, are terminated by groups of figures. Where the attic would be interrupted by the portico of ten columns, the cornice-lines of the attic-pedestals are carried across, or partly round the shafts. This device is no doubt intended for tieing the different parts together; but the aim is not reached; and the shafts of the upper order look stunted. The larger order runs along the east end of the building, and round the semicircle or apse, where there are two stories of niches. In the rear-walls of the porticoes are sculptured slabs. The staircase-hall would be highly effective, judging from the plan and section. There is a centre flight of steps up, opposite the entrance; and there are two parallel flights at the sides, down. Round the hall are columns, twelve on each side: the entablature of these forms the base for a passage-way and arcade,—the archivolts of the latter being carried by Persians or Caryatides, which are set in the reveals. Behind the arches are windows in the intercolumns of the attic-building. The front for Hemming's-row and Orange-street presents an effectively decorated wall, with a pavilion for the centre. Mr. Brodrick's design is set off by two large and effective views: indeed the drawings are complete, and the design matured, as compared with his design on the last occasion of a competition of which the drawings were exhibited in the Royal Gallery; when he was so fortunate as to get the third premium for what could not have been executed in the way that the drawing showed the work. Mr. Brodrick proposes to alter the arrangement of the Square by taking away the terrace-wall, and substituting steps for the whole length between the two large pedestals, of which one bears the statue of George IV. It has been suggested to us that Sir Charles Barry's choice of the balustraded wall in preference to steps, must have been governed by the design of the National Gallery, and made different from what it would have been had a flight of steps been a feature of the portico. The courts in Mr. Brodrick's design are characterized by extreme plainness. The principal galleries are 50 ft. in width.

Design No. 3, by the same author, is explained in a mere plan, which shows the spaces of the courts of the other design, nearly filled by parallel galleries, each 30 ft. in width.

We must sometimes reverse the order in which the two chief projects are taken up by the competitor. We adhere to the order in which they were originally stated by the Office of Works. Thus we arrive at Mr. Street's design for the "Enlargement of the Existing National Gallery." Of the drawings in this case, he says it is not necessary to say much in explanation. He has prepared them because "desired to do so; not because it will even be possible to enlarge the present Gallery with satisfactory results, unless, indeed, the existing building is so much altered as to make the work nearly as expensive as a reconstruction." He notes that the ground-floor is useless for exhibition-purposes; but, if side-lighting be admissible, we imagine that the main objections to the ground-floor now are as to the two ways through the building, and the steps down from the entrance-hall. He also notes the universal condemnation of the chief front; and he points out that the front to the rear would require treatment—apparently forgetting to note that there must be a new rear-front in any case, at least to Hemming's-row. His design consists of an addition, in the Gothic style, to the present Greco-Italian front. Retaining the present entrances, the staircase would be formed out of the large room lately added. The 50-ft. galleries would run north from this, and would have side-lighted cabinets at the side. With other galleries, these would form a quadrangle, — much as he has the arrangement of his other design. The floors would be raised considerably above the levels of the floors of the present building, "so as to render the ground-floor rooms really available as exhibition-rooms." The area of galleries and rooms for pictures would then be as here given, stating, however, the floor-space:—

The Gallery-floor:—			
Existing Galleries	14,300 ft.		
Additional Galleries	20,950		
		35,250 ft.	
Cabinets		7,175	
Total			42,425 ft.
The Ground-floor:—			
Existing building (space of an inferior kind), Turner Gallery and drawings of old masters...	6,339		
New Building:—			
1. Gallery and Rooms for drawings and prints in East Wing	6,480		
2. National Portrait Gallery on north side	9,145		
3. Rooms on west side of quadrangle, suitable either for water-colour drawings or original drawings ...	10,188		
		25,813	
			32,152 ft.
Total Exhibition-space			74,577 ft.

We have modified the form of statement; but the figures of course are the competitor's. Mr. Street points out that a great portion of the 74,577 ft. would not be so valuable as in the other design. He has certainly succeeded in designing an addition as incongruous as possible with the present structure, decoratively regarded.

In his design "for rebuilding the whole Gallery," he has been in his due position; and he has expounded his views, and given particulars of his intentions, in an elaborate pamphlet. Whatever be our estimate of the result of Mr. Street's work, in his drawings, we must say that his written statement, however we may sometimes differ from what is said in it, cannot be read without advantage. He says that the invitation to compete was one that he felt it was his duty to accept, as it had long seemed to him that the public mind was unjustly biassed towards a particular style of architecture "for our great institutions." After an expression (which, from him, we were gratified to read) of his distress and surprise at any disparagement of the Houses of Parliament, he says there has been a return, with bad results, to the old course wherein it seems to be assumed that some adaptation of Classical or Renaissance architecture is the only style allowable for museums, picture-galleries, and other such buildings. He mentions the fact that when his name was first uttered in connexion with the proposed competition, objection was immediately taken to him in the House of Commons on the ground that he would be sure to design a Gothic gallery, and that such gallery must needs be a failure. Now it seems to us, without expressing any approval of the decorative part of his present design, that Mr. Street is just as much in the wrong in his way of answering these remarks in the House, as were those who made the remarks. Is it not clear that the moment any architect allows the decorative character, chosen or imparted, of his design, to influence disadvantageously the serviceableness of the building, his production departs so much from good architecture? The operation of designing the gallery, in fact, should make the style, or help to do so: the gallery must not be adapted to a style. If our architects, whether Classicists or Gothicists, as designated, are unable to produce a well-lighted and otherwise suitable building for a National Gallery, the cause must be that they are alike moving in courses which are nearer to those of copyism and subjection to precedent, than to those which are the proper ones for the architect, and artist-architect, of his day. Mr. Street himself gives evidence in the mere matter of the writing to his drawings, of this subjection. When an architect prints "National Gallery" in such a guise that the greater number of people will read "Paciopal," or perhaps "Episcopal," Gallery,—and when for "Pictures" he writes what looks like the French for "Cigars," he not merely cuts off from himself his object,—if he does not even offend,—but he also helps to narrow his own mind. We could also believe that the seemingly-studious bad drawing of the portico of St. Martin's Church, in one of the views, had some similar explanation.

In Mr. Street's chosen arrangement of the galleries and rooms, as in much of his statement of principles of the planning of galleries, there is, as we have intimated, matter that deserves attention. He however overstates, we think, the element of the problem, comprised in the ground and site for the National Gallery. He says that when a gallery for pictures occupies one of the most costly sites in London, it is "criminal" on the part of the artist to waste land. Of course, he points here, and rightly enough, to the uneconomic planning of the present building, as regards its ground-floor, and its means of access to the portico. But he proceeds to say that "a Gothic building does not involve any of these difficulties,"—as though the defects of Wilkins's building had necessary connexion with present possible use of the style or models that Wilkins used. He has the truth of the matter lurking in his mind, where he says afterwards that he has "never seen a gallery yet, which was specially adapted for displaying pictures well, which had much architectural style of any kind in the planning or detail of the rooms,"—that what there is, "consists usually of decoration and nothing else," and that he "cannot conceive" why the "sort of work should present the slightest difficulty." He then states essentials of a gallery for pictures, very clearly; but he winds up by saying, he *maintains* that "these can be more easily obtained in a Gothic than in a Classical building." We cannot however go into all the points of the argument upon which Mr. Street has entered, or do justice to our own position, which is that in a right condition of our art, such questions would not be raised. It remains only to say with reference to the matter, that the Gothic influence has helped to satisfy Mr. Street of the advantage of covering the entire ground. His front to the Square is as symmetrical as that of any classic structure; but the eastern end of the building follows as nearly as possible the irregularities of the ground. He has not recollected that there would be some reason for giving up ground to the street.

We have yet more to say of Mr. Street's design, but must leave it for our next article.

PRIZES TO ART-WORKMEN, SOCIETY OF ARTS.

THE works sent in on the present occasion are 107 in number, and, though fewer than might have been anticipated, considering the numerous prizes offered, include works of greater merit than were found in the previous competition. The ironwork is much more satisfactory, and a piece of *repoussé* work in metal deserves especial commendation. The prizes have been awarded by Mr. Redgrave, R.A., and Mr. M. D. Wyatt, with the secretary, Mr. Le Neve Foster.

INCREASE THE SCHOOLS.

THE principal changes sought by the deputation from the Social Science Association who attended the Lord President of the Council on Tuesday last, were that a "certificated" teacher be not necessarily required "in town schools in which the fees in the aggregate do not amount to more than one-ninth of the total annual expenses," in order to obtain the Government grant; that the grant for average attendance be raised, except in infant schools, from 4s. to 5s., and the grant after examination from 8s. to 9s.; further, that wherever additional expense is incurred for industrial teaching a grant in aid be given. The Hon. A. Kinnaird, M.P., introduced the deputation. Mr. G. W. Hastings read the memorial setting forth what was asked; and the Rev. W. Clay further set forth the various points in it. It was shown that it is vain to expect that schools for this class of children aimed at can be permanently maintained by benevolent persons, for the burden is too heavy. In other elementary schools, the subscribers have to provide only about one-third of the annual income, the children's fees and the Government grants furnishing the rest; but in these the fees range from nothing to about one-ninth of the total cost, while experience has shown that schools frequented by the children of poverty-stricken parents, even if the conditions of the Revised Code were complied with, must always fall below the average standard, and consequently obtain, on the present terms, very small assistance from Goverement. That as to a certificated teacher, the existing requirement places poor schools at a great disadvantage, because the more efficient certificate-holders will not take charge of a school for destitute children in a squalid neighbourhood, unless induced to do so by a high salary. And with reference to

the asked-for grant in aid of industrial teaching, that however desirable industrial teaching may be in other elementary schools, in those for "neglected and destitute children" it is almost a necessity; partly because from their habits they are unfit to bear long mental exertion, and partly because they have to be taught in school to earn their livelihood.

The Rev. G. H. M'Gill supported the views set forth with illustrations from his own labours in the East of London. Mr. Charles Ratcliff (Birmingham) showed how the changes were needed in his town. From Manchester, evidence was given by one member of the deputation that masses of children were growing up without going to any school whatever. Mr. Godwin set forth, from his own experience, the condition of thousands of children in the metropolis whose only education was downwards, and who served to keep up the ranks of the criminal classes at great cost to the country. Mr. R. C. Hanbury, M.P., Mr. James Heywood, F.R.S., and others, also made confirmatory statements. The Duke of Buckingham and the Hon. Mr. Corry, who was with him, entered fully into the matter, and promised it should be considered by her Majesty's ministers.

In asking for exceptional treatment in favour of poor town schools, two dangers have to be avoided. In the first place, no inducement should be held out to any schools to lower their fees and their standard in the hope of obtaining larger grants; and, in the second place, parents able to pay the usual fees should not be tempted to send their children to free or very cheap schools. The first danger is guarded against by the moderation of the petition now forwarded. There are not many town schools in receipt of Government aid where the charge is so low as 2d. a week, and almost none where it is less. The demand is so moderate that, if granted, it will not be worth the while of any school now charging 2d. to lower the charge to 1d. Against the second danger it will be for the Education Department to guard. But as it has been found quite practicable to exclude from the existing schools a higher class than that for which they were intended, so it will not be difficult to confine the humbler description of schools which we wish to help to the use of the really poor. For our part, we go much further than the Association, and would insist upon education to good for every child. We assert, as we have often asserted before, that if this were done, even at the country's expense, the country would be the gainer, as well in a pecuniary point of view as in others more important still.

PARIS EXHIBITION AND ENGLAND.

AT the last meeting of the Commissioners, presided over by H.R.H. the Prince of Wales, it was determined to appoint a committee to promote a proper representation of Indian architecture. The Prince, on the same day (January 11), presided at a meeting of the Associate Commissioners, when deficiencies in certain classes were made known. We find that Terra-cotta, Bronze Castings, Plans and Models of Farm Buildings, and Plans of Cheap Dwellings, as matters at present stand, will be very inadequately represented in the Exhibition. Something should be done to remedy these deficiencies.

PARIS EXHIBITION OF 1867.

THE concession of the International Theatre has been granted to M. J. Reynier by the Commission, who has decided also that the internal decorations may be regarded as objects exhibited, after having been received by the Commission. Consequently they will be inscribed in the catalogue, and can compete for the prizes.

Russian peasants have been for some time in Paris: they are occupied during the day in constructing, in the park surrounding the building, huts after the model of their country. According to the French papers, they are anything but happy in their new life. They seem to be plunged in an incurable melancholy state. The snow enlivened them a bit, and gave them reason to exclaim that there was at least one good thing in Paris.

As to the Russian section, it occupies 1,000 square mètres (square mètre equal to $10\frac{3}{4}$ square feet nearly) in the rectangular part of the park, situated between the Exhibition building and the Avenue de Suffrein. We remark there:—

1. A large outhouse, two stories high, the lower portion being for exhibiting agricultural machines, and the upper story containing an inquiry office, lodgings for six *moujiks*, and the forage store.

2. Opposite, the office of the Russian commissioners,—a wooden pavilion, very ornamental, in the style of the boyards of Northern Russia. All the mechanism of construction is apparent. The chimney, of terra-cotta, is, as is the custom, capped with an iron pot turned upside down, and the bottom knocked out.

3. A great *isbah*, or peasant's cottage, composed of three buildings grouped together. There is, first, a building of red deal, forming a complete habitation. The walls are composed of round trees, barked and squared with an axe. The lower end of each piece is mortised, to receive a tenon on the top end of the lower piece, and the joints are made tight with tow.

The ground floor is laid out in stables and cow-houses. The upper story, divided into two rooms, comprises the habitation of the peasant and his children. In the angle is placed an immense stove, serving the double purpose of warming and baking. The staircase is outside. Adjoining the building is a covered courtyard, serving specially for sheltering the farm-carts which the Russians construct rather tastily.

Next follows a small habitation without stables, in white deal, put together as in a great house. It is a sort of guard pavilion, preceded by a portico.

In these different constructions there is neither nail nor peg. The whole of the *isbah* is a special article exhibited by the Domaine, under the direction of M. Gromoff, one of the greatest wood-merchants in St. Petersburg.

4. A vast construction, 249 ft. 4 in. by 23 ft., with pavilions at each side, and projecting main body in the centre, is intended for stabling the horses sent by Russia. These types of Russian breed will be arranged longways parallel to the wall, so that a visitor can see them to advantage; provided, of course, that one side of a horse is the same as the other side, and we think that it is. On the upper story there are lodgings for ten moujiks.

This building is well ornamented; the style being an application of the Russian hospodar art of the centre of the country to modern usage.

5. A *yourta*, or tent, 19 ft. 6 in. in diameter, in the form of a bee-hive, of felt sewn together. Above is an aperture for letting in light and air, and giving an exit to the smoke. How the air can go both ways we will not stop now to explain; suffice it to say that it is the national habitation of the Cossacks and the nomade Tartars.

Among the curiosities of nations to be presented to the public at the Exhibition we may cite the Chinese portable kitchen.

One man carries it on his shoulders and serves out his culinary produce to customers. It is a structure of wonderful lightness; especially so by the employment of bamboo cane, to which it is suspended. The contrivance is 2 mètres high and 3 mètres wide. One hand of the carrier steadies the machine while the other minds the cooking, tends the fire, and serves the public; in the front compartment, on the first shelf, are plates and dishes well arranged; on the second shelf, wood and matches; on the "ground-floor" is arranged the cooking apparatus. The back compartment contains all that can comfort man, in a raw state. Meat, poultry, fish, vegetables and herbs, peppers, spices, &c. For an extremely small sum a workman, in China, can have a comfortable repast without quitting his place of work; all he has to do is to beckon to the *restaurant*-man, and up comes the dinner.

Another ambulatory occupation is that of barber. This Chinese "shaver" has a boiler of hot-water on his head. On his shoulder is a bamboo, carrying at one end the provision of cold water, at the other end the traditional shaving-dish, a razor, and towel. He not only takes off the beard, but the hair of the head also, leaving a small tuft, enjoined by the Mandchous under penalty of death.

A bull-fight circus, to accommodate 15,000 persons, is to be erected. The horns of the bulls in action will be balled, so as to render them innocuous, and the sword blunted; so that, instead of blood, the only vital element spent will be money in the shape of costumes, which are to be represented in the most sumptuous manner.

A lecture-building is being constructed in the park, in the form of a theatre, by a company of whom M. Pierre Petit, the photographer (photographic concessionist for the Exhibition), is director. It will hold 500 persons seated. Several lecturers have been engaged to explain the progress of science, arts, manufactures, the machines exhibited, &c. These lectures, given in French, English, Italian, Spanish, and German, promise to be extremely interesting.

PROPOSED ART EXHIBITION IN LEEDS.

THE prospects of the proposed "National Exhibition of Works of Art," to be held in Leeds, in 1868, appear very promising. The guarantee fund amounts to 110,000*l.*, or some 35,000*l.* more than the Manchester people raised for the Art Treasures Exhibition in 1857.

The Right Hon. the Earl Fitzwilliam is the president of the general council, and Mr. W. Beckett Denison, chairman of the executive committee.

Castle Howard and Chatsworth are placed at the disposal of the committee, and the Exhibition bids fair to be one of truly national importance; we hope even surpassing that of Manchester in 1857. Mr. J. B. Waring is the general manager or chief commissioner.

SANITARY MATTERS.

Chorlton.—The monthly report of Mr. G. Greaves, the consulting medical officer of the Chorlton workhouse, states that, on November 30, there were 13 fever cases in the hospital, nearly all of which were convalescent, 15 more were admitted to December 31; during that month one patient died, 11 were discharged cured; and on the 31st of December, 16 remained in the hospital. Mr. Greaves wrote, under date January 1, that the only unsatisfactory feature in the returns was the increase of typhus in some parts of the union, which some months ago had almost disappeared from the wards. Fifteen fresh cases had been admitted, most of them within the last fortnight. Two entire families had been admitted, and, having visited the house from which one of them came, he thought it right to lay before the guardians the result of his inspection. The house was in Riga-street, Hulme, a low and crowded neighbourhood, and very near the river Medlock. The back windows overlooked Riga-court, which was closed at one end, and at the closed end, under the windows of the house, were some filthy and dilapidated public conveniences. The drainage of the surface and the ashpits appeared to be imperfect. No attempt had been made to purify or disinfect it. The floor and walls were very dirty. He was informed that the furniture had been seized for arrears of rent after the fever had broken out, and, after passing through the broker's hands, had most probably been distributed over the city, carrying with it the infection, which was of a most malignant type.

Newcastle-upon-Tyne.—Another of the local medical men has been cut off by fever. Mr. Gilchrist, surgeon, after attending to fever patients located in some of the most filthy places in the town, there caught the fever of which he died. Newcastle is notorious for fevers and a high rate of mortality.

Winchester.—Eleven competition plans have been sent in for the sewerage of the city. There is a surmise that the estimates for the main drainage works will range from 13,000*l.* to 20,000*l.*, but nothing certain was known of the result. In connexion with the utilization of the Winchester sewage, the *Hampshire Independent* gives the following extract from a letter in a daily paper:—"I do not know what difference there may be as regards productive capabilities between sand recently removed from the seaside and the sand of those immense plains in which Berlin is situated, and which, extending to the Baltic, are, I presume, of marine origin; but this I can state with absolute certainty, that of all descriptions of manure, sewage is here in the greatest request, and that very abundant crops are produced by its application to the sand soils of this district, which have not any surface vegetable soil, and are certainly 10 or 20, or more, feet in depth."

Carnarvon.—Dr. Seaton, who was sent down to Carnarvon by the Privy Council, has just made his report on the cholera in that town. Dr. Seaton found that, out of a population of 9,000

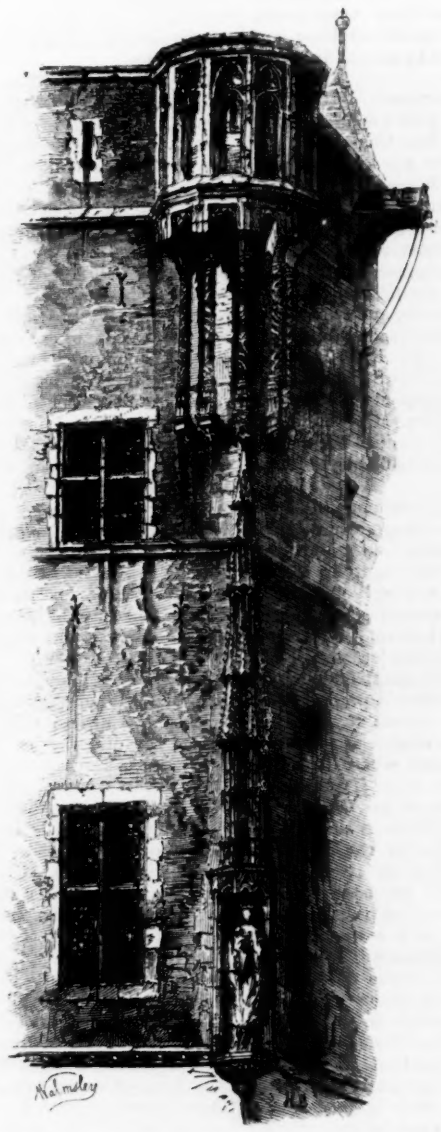
persons, there had been during the five weeks preceding his visit not less than sixty deaths from cholera. The disease has not been confined to any particular portion of the town, nor has it by any means been limited to the very poorest people. One-third of the deaths have, however, occurred in a single street; and in the county gaol, which is situated in a narrow street, in a low part of the town facing the Menai Straits, there have been, in a population of thirty prisoners, six cases of cholera (four of which have proved fatal), and three or four of diarrhœa. Of the sanitary state of the town Dr. Seaton speaks thus:—"In Carnarvon there exists everything to invite and give intensity to an outbreak of cholera, or any other infectious or epidemic disease—great overcrowding and bad house construction, bad water-supply, bad drainage, absence of privy accommodation, and accumulation of surface nuisances." The overcrowding he describes as being of the worst kind. Not merely are the people crowded into houses numerically incapable of holding them, but the houses themselves are huddled together on a wholly insufficient space of ground.

OLD HOUSE AT COLOGNE.

NOTWITHSTANDING the ravages of time and the worse destruction caused by the requirements of modern times, the ancient city of Cologne still possesses many fine specimens of Mediæval domestic work.

The houses are of two distinct classes; first the ordinary gabled half-wood buildings common in all old towns; and, secondly, large stone fortified houses of very superior architecture and construction. Of these latter, perhaps, the "Gürzenich-haus" is the finest example.

Our illustration, drawn on the spot, represents the angle of one of these fortified houses near the Rath-haus.



ANCIENT DOMESTIC ARCHITECTURE, COLOGNE, GERMANY.

GREENOCK COURT HOUSE, SCOTLAND.

THE principal front toward Nelson-street, of the new Court-house, for Greenock, presents a façade 100 ft. in length, and three stories in height, with a massive tower in the centre. The tower is finished above, at the angles, with corbelled turrets, and is surmounted by a spire, which rises to the height of 112 ft. from the ground. The door, which penetrates the base of the tower, is flanked with columns, and buttresses on either side supporting the lower part of the tower. A boldly moulded segmental arch springs from the capitals of the columns. Above the level of the street floor, and extending up to a level with the ridge of the roof, the tower is square, having no projection or break; but each angle of the front is recessed, the recess containing a shaft carved in a spiral form. Above the door is a window, with label and panel over it, and opening upon a stone balcony, carried out above the doorway, and having a parapet of cusped tracery. This window is on a level with the first-floor of the building. Above it, and level with the second-floor, there are two windows with plain segmental arched heads, having above and between a large circular carved panel, with a shield on which will be engraved the arms of the town. On the level of the ridge of the roof, and at a height of 57 ft., the upper portion of the tower is carried out, and flanked with circular turrets, finished with conical roofs. From the corbelling rises a parapet, and behind and between the corbels the front of the tower is finished with a high gable, filled with a semicircular-headed window of two lights, the gable being crocketed, and surmounted with a lion *sejant rampant*. The roof of the tower beginning in a square form, becomes octagonal, as it tapers upwards to a height of 30 ft., from which altitude rises an octagonal lantern, with a conical roof, the lantern having columns at each of the eight angles, with bold bases and capitals. The façade on each side of the tower shows a row of three windows in each story. Those on the ground-floor have segmental arched heads, with label mouldings over them. Those on the first-floor are simple square-headed windows. Above the first-floor is a parapet carried on corbelling, from which rises the upper tier of windows, projecting from the roof, and finished with gablets furnished with crockets and finials. This portion of the building presents at each end a double gable. Between the gables there rises a high ornamental chimney-stalk; and flanking the gables on the outside are circular turrets, somewhat similar to those on the tower, between which the corbelled-out parapet is continued on the same level as that described in front. The turrets are supported on shafts spirally cut, like those in front, and resting on the top of the buttresses, which extend up through the ground-story of the building. On the north gable the principal feature is the great window of the staircase, extending through two stories, and divided into a large centre division of two lights, and two side divisions of one light, each moulded and finished with label mouldings. In general style, the building may be said to belong to the Scottish Baronial.

The building is divided into two portions, the front portion, which extends back about 50 ft., being three stories in height, and containing offices for the sheriff, the sheriff's clerk, the procurator fiscal, &c., with a dwelling-house for the keeper. The entrance-hall is lighted, when the door is shut, by narrow windows on each side of the doorway. This hall is 16 ft. wide, 22 ft. in length, and runs into a corridor 17 ft. wide, and about 60 ft. in length, having at one end of it the public staircase, giving access to the upper portions of the building. Opposite the door, at the further end of the corridor, is the Court-room, forming the back part of the edifice. This apartment is 47 ft. long by 38 ft. in wid th and the roof is placed at a height of 31 ft. On either side of the Court-house there are narrow corridors leading at right angles from the large corridor, and giving access to the different portions of the floor appropriated to the accommodation of the jury, witnesses, &c. The back building is only of one story, but it rises to the height of the second story of the front part of the building. There is a smaller Court-house, situated for the sake of convenience in the front building. This apartment is on the right-hand side on passing through the door into the entrance-hall, and has rooms for the sheriff attached to it.

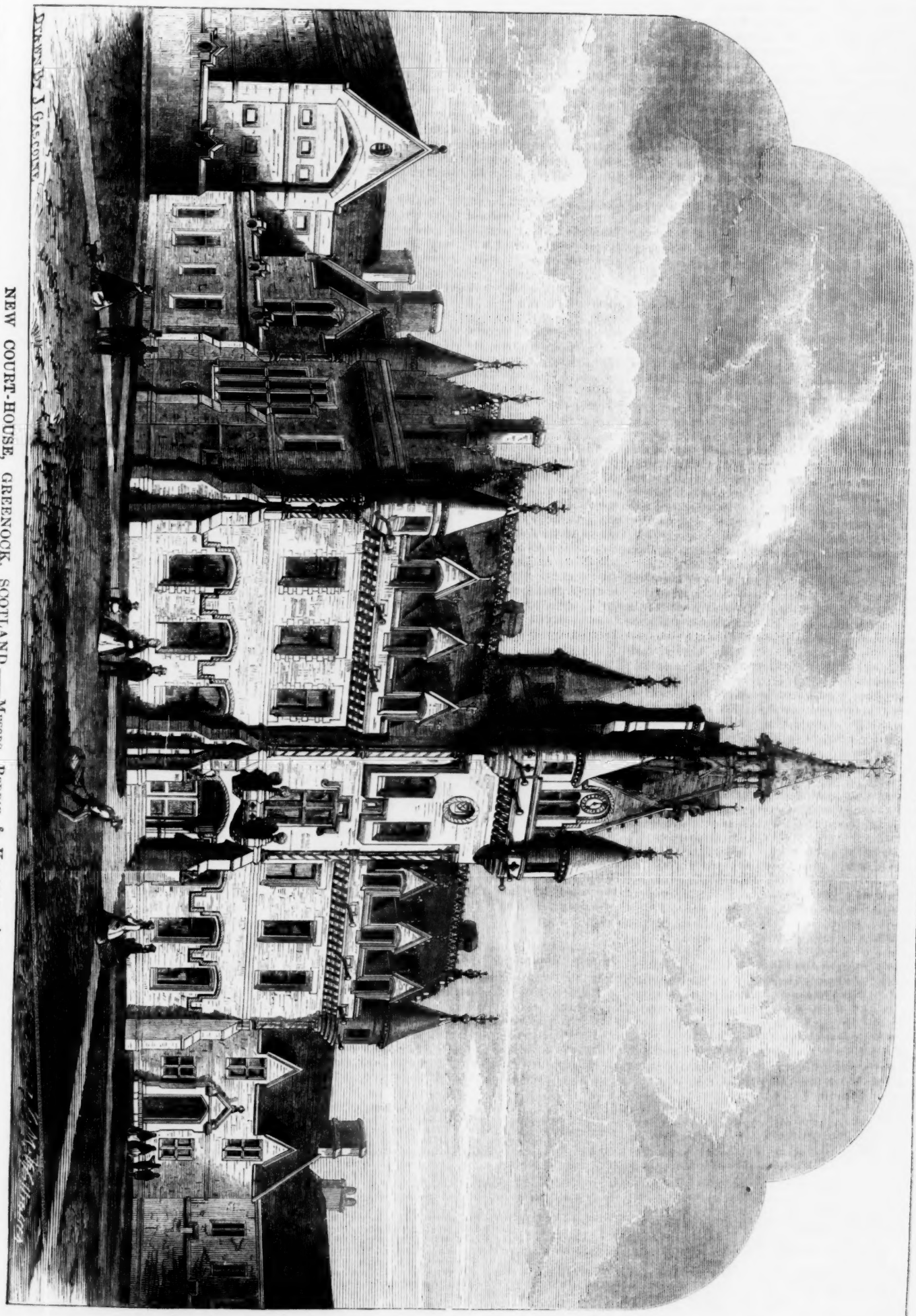
The architects are Messrs. Peddie & Kinnear.

The foundations of the building have been laid, and the works are being proceeded with as speedily as the present state of the weather will allow.*

* The following is a list of the contractors:—

Mason's Work.			
John Coghill & Co., Yoker	£5,061	0	0
Joiner's Work.			
Stewart Alison, Greenock.....	2,373	0	0
Plumber's Work.			
Malcolm Chalmers, Port Glasgow	502	0	0
Plasterer's Work.			
Colin Paul, Greenock.....	341	0	0
Slater's Work.			
Shaw & Imrie, Greenock	109	10	11
Total.....	£8,386	10	11

NEW COURT-HOUSE, GREENOCK, SCOTLAND.—MESSRS PEDDIE & KINNEAR, ARCHITECTS.



NEW COURT-HOUSE, GREENOCK, SCOTLAND.—MESSRS PEDDIE & KINNEAR, ARCHITECTS.

ART IN ROME.

WE have seen the groups executed by the Danish sculptor, Jerichau, for the Princess of Wales, as already mentioned in the English papers. His "Adam and Eve," at the moment the former awakes to find his newly-created spouse at his side, is impressive and original, admirable for the expression of astonishment and delight, tempered with tenderness, in Adam (whose head is nobly beautiful), and for the modest, timid sweetness of Eve, who kneels beside his half-recumbent figure. The group of "Girls Bathing," or rather leaving the bath in alarm at some stranger's approach, represents a younger and elder sister, the former taking refuge in alarm on the bosom of the latter,—the situation presented with much grace of movement and outline. This artist's statue of a hunter taking away the cub from a panther, and defending himself from the enraged dam, ordered by Sir Francis Goldsmid, is the reproduction of a work first executed several years ago, and hitherto the most popular of all he has done during a residence of many seasons in Rome.

Among other novelties that we have seen in Roman studios within the last few weeks, we may mention with praise such fine examples of portrait-sculpture as the bust and statue of Mr. Gladstone, and the bust of Lord Brougham (ætat. 89) by Mr. Adams, alike admirable for the expression of calm power and for strongly-marked individuality. If, as that aged statesman declared to him, no *other* artist is to be honoured by sittings from Lord Brougham in his future life, Mr. Adams's likeness will indeed acquire additional and extrinsic interest for posterity.

THE PRESERVATION OF WOOD IN DAMP AND WET SITUATIONS.*

IN 1846, eighty thousand sleepers of the most perishable woods, impregnated, by Boucherie's process, with sulphate of copper, were laid down on French railways. After nine years' exposure, they were found as perfect as when laid.† This experiment was so satisfactory that most of the railways of that empire at once adopted the system. We would suggest washing out the sap with water, which would not coagulate its albumen. The solution would appropriately follow.

Both of the last-named processes are comparatively cheap. The manufacturing companies of Lowell, Mass., have an establishment for "Burnettizing" timber,‡ in which they prepare sticks 50 ft. in length. Under a pressure of 125 pounds per square inch, they inject from two to eight ounces of the salt into each cubic foot of wood. The cost, in 1861, was from 5 dols. to 6 dols. per 1,000 ft., board measure.§ Boucherie's method must be still cheaper. It costs less than creosoting by one shilling per sleeper.‖

An American engineer, Mr. Hewson, for injecting railroad sleepers, proposes a vat deep enough for the timbers to stand upright in. The pressure of the surrounding solution upon the lower ends of the sticks will, he thinks, force the air out at their upper extremities, kept just above the surface of the solution, after which the latter will rise and impregnate the wood. In 1859, he estimated chloride of zinc at 9 cents per pound, sulphate of copper at 14 cents per pound, and pyrolignite of iron at 23 cents per gallon. He found the cost of impregnating a railway tie with sufficient of those salts to prevent decay, to be—for the chloride of zinc 2·8 cents, for blue vitriol 3·24 cents, for pyrolignite of iron 7·5 cents.¶

Among the numerous other preservative compounds, may be mentioned, Le Gras's mixture** of double salt of manganese and lime (or zinc) with creosote, Payne's solutions†† of sulphate of iron and muriate of lime, forming by double decomposition an insoluble sulphate of lime among the wood fibres; Margery's solution of acetate of copper, and Ransom's liquid silicate of potassa.* Payne's process met with some favour, but neither of the last is of appreciable value.

Vessel-owners had long ago observed that those ships which have early sailed with cargoes of salt are not attacked by dry-rot; indeed, several instances are well attested of vessels whose interiors were lined with fungi, having all traces of the plant destroyed by accidental or intentional sinking in the sea. Acting on such hints, a trader of Boston salted his ships with 500 bushels of the chloride, disposed as an interior lining, adding 100 bushels at the end of two years.† Such an addition of dead weight (35,000 pounds in this case) is sufficient objection to a procedure which has other great disadvantages.

The unpleasant odour of creosote is greatly against its use upon lumber for dwellings, and Bethell's process, therefore, is not described here, although the most satisfactory known. Pyrolignite of iron is offensive, and also highly inflammable. The affinity of the chlorides for water keeps the structure into which they are introduced wet; besides, they corrode the iron-work. Sulphate of copper is free from these objections, and is at present cheaper than the chlorides; therefore, *for protecting wooden structures against dry-rot*, in damp situations, like mines, vaults, and the basements of buildings, *sulphate of copper seems preferable, and Hewson's or Boucherie's method of injecting it cheaper and more expedient, according as the timber is short or long.*

II. *Wood alternately wet and dry.*—The surface of all timber exposed to alternations of wetness and dryness gradually wastes away, becoming dark-coloured or black. This is really a slow combustion, but is commonly called wet rot, or simply rot. Other conditions being the same, the most dense and resinous woods longest resist decomposition. Hence the superior durability of the heart-wood, in which the pores have been partly filled with lignine, over the open sap-wood, and of dense oak and lignum-vitæ over light poplar and willow. Hence, too, the longer preservation of the pitch-pine and resinous "jarrah" of the East, as compared with non-resinous beech and ash.

Density and resinousness exclude water; therefore our preservatives should increase those qualities in the timber. Fixed oils fill up the pores and increase the density. Staves from oil barrels and timbers from whaling-ships are very durable. The essential oils resinify, and furnish an impermeable coating. But pitch or dead oil possesses advantages over all known substances for the protection of wood against changes of humidity. According to Professor Letheby,‡ dead oil, 1st, coagulates albuminous substances; 2nd, absorbs and appropriates the oxygen in the pores, and so protects from eremacausis; 3rd, resinifies in the pores of the wood, and thus shuts out both air and moisture; and, 4th, acts as a poison to lower forms of animal and vegetable life, and so protects the wood from all parasites. All these properties specially fit it for impregnating timber exposed to alternations of wet and dry states, as, indeed, some of them do, for situations damp and situations constantly wet. Dead oil is distilled from coal-tar, of which it constitutes about ·30, and boils between 390° and 470° Fahr. Its antiseptic quality resides in the creosote it contains. One of the components of the latter, carbolic acid (phenic acid, phenol) C_{12} H_6 O_2,§ the most powerful antiseptic known, is able at once to arrest the decay of every kind of organic matter.‖ Prof. Letheby estimates this acid at ½ to 6 per cent. of the oil. Chrysilic acid C_{14} H_8 O_2, the homologue of carbolic acid, and the other component of creosote, is not known to possess preservative properties.

Bethell's process* subjects the timber and dead oil, enclosed in huge iron tanks, to a pressure varying between 100 and 200 pounds per square inch, about twelve hours. From eight to twelve pounds of oil are thus injected into each cubic foot of wood. Lumber thus prepared is not affected by exposure to air and water, and requires no painting.† A large number of English railway companies have already adopted the system.‡ Eight pounds of oil per cubic foot is sufficient for railway sleepers.§

The cost of "creosoting," as this process is sometimes called, was given in 1855, by Ronald and Richardson, at somewhat less than 4d. per cubic foot,‖ in England. At 1s. per gallon,¶ the price at which dead oil was obtainable in England in 1863, 4d. per cubic foot would, we presume, be sufficient.

A process recently patented, and described in the *Scientific American*, February 17, 1866, proposes to introduce highly heated oleaginous vapours among the timber, confined in an iron tank. The patentee** hopes, that as fast as the moisture is expelled from the wood, the vapour will take its place. Whether this substitution would not soon arrest itself, should it even commence, is in our mind a debatable question.

While an external application of coal-tar promotes the preservation of dry timber, nothing can more rapidly hasten decay than such a coating upon the surface of green wood. But this mistake is often made, and dry rot, instead of wet rot, does the work of destruction.†† The reason must appear from what has been said on dry rot. Carbonizing the surface also increases the durability of dry, but promotes the decay of wet, timber. Farmers very often resort to one of the latter methods for the preservation of their fence-posts. Unless they discriminate between green and seasoned timber, these operations will prove injurious instead of beneficial.

In this connexion, we remark, that inverting a post from the position in which it grew, is by some supposed to retard decay. According to the president of the "Northern Architects' Association," England, "the *valves*" close against moisture ascending through the ducts from the earth into the post.‡‡ But, according to Gray, thin places only separate contiguous ducts. Fluids can pass through them in *one* direction as well as in the *other*. When age obliterates these thin mediums, nothing opposes the flow upward or downward. Furthermore, the passage of fluids through wood is not confined to ducts: it takes place on all sides of them as well. In face of these facts, very careful experiments will be requisite to convince us that a post is more durable in the inverted than in the normal position.

III. *Timber constantly Wet in Salt Water.*—We have not to guard against decay when timber is in this situation. *Teredo navalis*, a mollusk of the family *Tubicolària*, Lam., soon reduces to ruins any unprotected submarine construction of common woods. I quote from a paper read before the "Institute of Civil Engineers," England, illustrating the ravages of this animal:—

"The sheeting at Southend pier extended from the mud to 8 ft. above low-water mark. The worm destroyed the timber from 2 ft. below the surface of the mud to 8 ft. above low-water mark, spring-tide; and out of thirty-eight fir-timber piles and various oak-timber piles, not one remained perfect after being up only three years."§§ Specimens of wood, taken from a vessel that had made a voyage to Africa, are in the

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* See p. 25, *ante*.
† *Journal of the Franklin Institute*, vol. xxxii., pp. 2, 3.
‡ *New American Cyclopædia*.
§ The Philadelphia, Wilmington, and Baltimore Railroad Company have used the process since 1860 with complete success. The Union Pacific Railroad Company have recently erected a large building for this purpose. Their cylinder is 75 ft. long, 61 in. in diameter, and capable of holding 250 ties. They "Burnettize" two batches per day.—*Report on Pacific Railroad, by Col. Simpson*, 1865.
‖ *Journal of the Franklin Institute*, vol. xxxii., pp. 2, 3.
¶ *Ibid.* vol. xxvii., p. 8.
** *Civil Engineers' Journal*, vol. xviii., p. 20.
†† *Ibid.*, vol. vi., p. 207.

* Fifty pounds of carbonate of potassa are dissolved in water, and a little lime is added to neutralize any free acid; 100 pounds of flints are added, and the whole exposed ten or twelve hours to a temperature of 300° F. This solution is evaporated to 1·500 at 60°.—*Civil Engineer's Journal*, vol. ix.
† *American Journal of Science*, vol. ii., p. 17.
‡ *Civil Engineer's Journal*, vol. xxiii., p. 216.
§ "Creosote from coal undoubtedly contains two homologous bodies, C_{12}, H_6, O_2, and C_{14}, H_8, O_2, the first being carbolic and the second cresylic acid."—*Ure's Dict. of Arts, Manufactures, and Mines*, vol. ii., p. 623.
‖ "I have ascertained that adding one part of carbolic acid to five thousand parts of a strong solution of glue will keep it perfectly sweet for at least two years. . . . Hides and skins, immersed in a solution of one part of carbolic acid to fifty parts of water, for twenty-four hours, dry in air and remain quite sweet."—*Prof. Crace Calvert, Ann. Sc. Discov.*, 1865, p. 55.
"Carbolic acid is sufficiently soluble in water for the solution to possess the power of arresting or preventing spontaneous fermentation. Saturated solutions act on animals and plants as a virulent poison, though containing only 5 per cent. of the acid."—*Civil Engineer's Journal*, vol. xxii., p. 216.
"Parasitic and other worms are instantly killed by a solution containing only ½ per cent. of acid, or by exposure to the air containing a small portion of the acid. . . . . By examining the action of a leaf, we find the albumen is coagulated. All animals with a naked skin, and those that live in water, die sooner than those that live in air and have a solid envelope."—*Dr. I. Lemaire, Ann. Sc. Discov.*, 1865, p. 238.
* Ronald and Richardson's "Technology," p. 739.
† Ure's "Dictionary of Manufactures and Mines."
‡ The Great Western, North-Eastern, Bristol and Exeter, Stockton and Darlington, Manchester and Birmingham, and London and Birmingham.—*Ure's Dictionary of Manufactures and Mines.*
§ *Journal of the Franklin Institute*, vol. xliv., p. 275.
‖ Chemical Technology, p. 737.
¶ Dr. J. G. Ashby in the *London Mechanics' Magazine*, July, 1862. He says, "Crude carbolic acid can be obtained for one shilling," but undoubtedly means dead oil.
** Louis S. Robbins, New York City.
†† According to Col. Berrien, the Michigan Central Railroad Bridge, at Niles, was painted, *before seasoning*, with "Ohio fire-proof paint," forming a glazed surface. About five years after it was so badly dry-rotted as to require rebuilding.
‡‡ The *Builder* for 1866, p. 79.
§§ *Civil Engineer's Journal*, vol. xii., p. 382.

museum, and show how this rapid destruction is effected.

None of our native timbers are exempt from these inroads. Robert Stephenson, at Bell Rock, between 1814 and 1843,* found that green-heart oak, beef-wood, and bullet-tree were not perforated, and teak but slightly so. Later experiments show that the "jarrah" of the East, also, is not attacked.† The cost of those woods obliges us to resort to artificial protection.

The teredo never *perforates* below the surface of the sea-bottom,‡ and probably does little injury above low-water mark. Its minute orifice, bored across the grain of the timber, enlarges inwards to the size of the finger, and soon becomes parallel to the fibre. The smooth circular perforation is lined throughout with a thin shell which is sometimes the only material separating the adjacent cells. The borings undoubtedly constitute the animal's food, portions of woody fibre having been found in its body.§ While upon the surface only the projecting siphuncles indicate the presence of the teredo, the wood within may be absolutely honey-combed with tubes from 1 in. to 4 in. in length.

It was naturally supposed that poisoning the timber would poison or drive away the teredo; but Kyan's, and all other processes employing solutions of the salts of metals or alkaline earths, signally failed. This, however, is not surprising. The constant motion of sea-water soon dilutes and washes away the small quantity of soluble poison with which the wood has been injected. If any albuminate of a metallic base still remains in the wood, the poisonous properties of the injection have been destroyed by the combination. Moreover, the lower vertebrates are unaffected by poisons which kill the mammals. Indeed, it is now known that certain of the lower forms of animal life live and even fatten on such deadly agents as arsenic.‖

Coatings of paint or pitch are too rapidly worn away by marine action to be of much use; but timber, thoroughly creosoted with ten pounds of dead oil per cubic foot, is perfectly protected against *teredo navalis*. All recent authorities agree upon this point. In one instance, well authenticated, the mollusk reached the impregnated heart-wood by a hole carelessly made through the injected exterior. The animal pierced the heart-wood in several directions, but turned aside from the creosoted zone.¶ The process and cost of "creosoting" have already been discussed.

A second destroyer of submarine wooden constructions is *limnoria terebrans* (or *L. perforata*, Leach), a mollusk of the family *Asellotes*, (Leach), resembling the sow-bug. It pierces the hardest woods with cylindrical, perfectly smooth, winding holes, 1-20th to 1-15th of an inch in diameter, and about two inches deep.** From ligneous matter having been found in its viscera some have concluded that the *limnoria* feeds on the wood, but since other mollusks of the same genus, *Pholas*, bore and destroy stone-work, the perforation may serve only for the animal's dwelling. The *limnoria* seems to prefer tender woods, but the hardest do not escape. Green-heart oak is the only known wood which is not speedily destroyed.†† At the harbour of Lowestoft, England, square 14-inch piles were, in three years, eaten down to 4 in. square.‡‡

While all agree that no preparation, if we except dead oil, has repelled the limnoria, an eminent English engineer has cited three cases in which that agent afforded no protection.§§

We do not find that timber impregnated with water-glass has been tested against this subtle foe. The experiment is certainly worthy of a trial.

A mechanical protection is found in thickly studding the surface of the timber with broad-headed iron nails. This method has proved successful.‖‖ Oxydation rapidly fills the interstices between the heads, and the outside of the timber becomes coated with an impenetrable crust, so that the presence of the nails is hardly necessary.

In conclusion, we cannot but express surprise that so little is known in this country (America) concerning preservative processes. Their employment seems to excite very little interest, and the very few works where they are being tested attract hardly any attention. Those railroads which have suspended their use assign no reasons, and those upon which the timber is injected publish no reports concerning the advantages of their particular methods. Even the National Works, upon which Kyan's process was formerly employed, have laid it aside, and now subject lumber to dampness and alternations of wetness and dryness, without any preparation beyond seasoning. When sleepers cost fifty cents and creosoting thirty cents each, it is cheaper to hire money at 7 per cent., compound interest, than to lay new sleepers at the end of seven years. Allowing any ordinary price for the removal of the old and laying down the new ties, the advantage of using Bethell's process seems evident. If some cheaper method will produce the same effects, the folly of neglecting *all* means seeking to increase the durability of the material is still more palpable.

H. W. LEWIS.

* *Civil Engineer's Journal*, vol. xx., p. 16.
† The *Builder* for 1862, p. 511.
‡ *Civil Engineer's Journal*, vol. xx.
§ Ibid., vol. xii., p. 382. Also Dict. Univer. d'His. Natur., tome xii.
‖ *British and Foreign Medical Review*.
¶ *Civil Engineer's Journal*, vol. xii., p. 191.
** Dict. Univer. d'His. Natur.
†† *Civil Engineer's Journal*, vol. xxv., p. 206.
‡‡ Ibid., vol. xvi., p. 76.
§§ Ibid., vol. xxv., p. 206.
‖‖ Ibid., vol. xii., p. 382.

THE DESIGNS FOR THE LAW COURTS.

THE designs have been sent in, and will be hung forthwith. To admit of certain preliminary arrangements they will not be open to view till next month; probably on Friday and Saturday, the 8th and 9th of February, for private view by members of the Government, peers, members of the House of Commons, judges of the Superior Courts, foreign ambassadors, and other distinguished persons. After the first two days the exhibition will be open for four weeks, *i.e.*, as at present arranged, till Saturday, the 9th of March. On Mondays, Tuesdays, and Wednesdays, to the Commissioners and their officers, the legal and architectural professions, and to artists. On Thursdays, to the public—by cards obtainable at the office of the Commission. Fridays will be reserved for the special work of the Commission; and Saturdays for members of the Government and members of both Houses of Parliament.

We understand that the cost of the shed in New-square for the exhibition of the designs has been exaggerated. Including furniture and matting, it amounts to about 1,120*l.*

Previously to any decision on the designs, the Architectural Clerk is to examine them and report as to how far the instructions have been attended to, and on the comparative merits of the plans with reference to other matters ascertainable by calculation. In this, we believe, Mr. Geo. Pownall and Mr. John Shaw, architects, will assist.

We have received letters from the provinces begging that efforts may be made to keep open the Exhibition of the National Gallery designs till those for the Law Courts can be seen, or, at any rate, till nearer this time than the 26th inst., now spoken of for closing it; so that architects and others from the country may be able to see both without sacrificing nearly three weeks.

DUBLIN.

A CONSIDERABLE addition has been made at 74, Grafton-street, Dublin, enclosing with the front house a court in the centre, like several of the dwellings in Paris. The arches of the windows are varied on each story, and are surmounted by hood mouldings and fascias which are continued on the front. A tank has been built of brick and cement, to hold a large quantity of water, to flush and cleanse the drains; and care has been taken to prevent damp in the foundation-walls. Mr. Oliver Healy, of Dublin, was the architect; and Mr. Peter Casserly, the contractor.

BUILDING OPERATIONS, DURHAM.

AT the Quarter Sessions, held on the 2nd instant, the magistrates agreed to expend the sum of 5,000*l.* in remodelling the Assize Courts, from plans prepared by the county architect, Mr. William Crozier, assimilating the internal arrangements and ventilation of the courts to the Manchester Assize Courts. The county architect has the following works in course of construction, viz.:—a new men's wing, containing 126 cells, &c., at the county prison, Durham; Mr. D. S. Appleby, contractor; cost, 7,000*l.* At Darlington the same contractor is building a new county police station and courts; amount of contract, 3,000*l.* At Castle Eden is also being built a new police station and courts, at a cost of 1,200*l.*; and at Ryhope and Washington villages, second-class police stations and cells, at a cost of 450*l.* each. Plans are also in course of preparation for two new wings to the Sedgefield Lunatic Asylum, for 320 patients, at an estimated cost of 10,000*l.* Mr. Crozier has charge of all these works, and has designed and carried out during the last seven years for the county upwards of 50,000*l.* worth of work, consisting of additions to the gaol, lunatic asylum, police stations and courts, and three large militia barracks at Hartlepool, Barnard Castle, and Durham respectively. The magistrates at their last meeting increased his salary 100*l.* per annum, besides presenting him with 400*l.* for past extra services.

THE TRADES MOVEMENT.

A SOCIETY, we hear, is in course of formation, having for its object the succour and protection of those members of the working classes who disagree with the tenets held by the trades unions. The society has already received large promises of support, and several eminent manufacturers have consented to sit upon the committee.

Leamington. — A meeting of the Master Builders' Association has been held to further consider the application of the operatives for an increase of 3s. per week in their wages, raising the amount to 30s. It was decided that the present condition of the building trade in Leamington would not justify a compliance with their request.

Liverpool.—Half the shipjoiners on board the *Great Eastern*, those employed by Messrs. Jones, Quiggin, & Co., have struck for an advance of wages from 5s. 6d. per day and 1s. a day river money, to 6s. a day and 1s. river money, as paid to the other half of the men by Messrs. W. H. Potter & Co. The men on strike are paid full wages by the society of joiners while they remain idle.

Carlisle.—The strike among the stonemasons which has been going on for so many months is nominally continued; but virtually it may be said to be at an end. The builders, while persistently refusing to accede to the regulations which the society sought to impose, as to the apprentices and other matters, have conceded the advance of wages 2s., and the local *Journal* states that all the masters have now as many men as they require. The new bank at the top of Botchergate is making much more rapid progress, there being now about a dozen masons employed upon the work, in addition to the apprentices. After they decided to give the masons an advance of 2s. a week, the masters sent word to the bricklayers that in the summer the same advance would be given to them. With this, however, the bricklayers are not, it is said, content, and they have asked for an increase of 4s. instead of the 2s. offered.——The master joiners of this city dined together at the Lion and Lamb Hotel on Wednesday evening before last.

Lancashire.—The strike of operatives in Lancashire has come to an abrupt termination, and the men, 5,000 in number at Darwen alone, who refused to proceed to work on the reduced terms, have intimated their intention to return to their employment. Similar decisions have been arrived at by the operatives in other towns where a dispute was anticipated.

DISTRIBUTION OF THE PRIZES OF THE ISLINGTON EXHIBITION.

ON Saturday afternoon the ceremony of distributing the prizes won at the Metropolitan and Provincial Working Classes' Industrial Exhibition, at the Agricultural Hall, Islington, took place at Exeter Hall. Mr. G. J. Goschen, M.P., presided. A pretty pamphlet, forming a record of the exhibition from its opening to its closing, was presented to every person who attended the ceremony. The awards numbered altogether 461, of which 55 were silver medals, 187 bronze medals, and 189 certificates of honourable mention. In addition to these, which were one and all got up with taste and appropriateness, a framed view of the late Exhibition had been prepared for presentation to every one of the 1,500 exhibitors. There

were, besides, the special prizes, which amounted to 57*l.*

In addition to the silver medal, the highest of the prizes, which was the sum of 10*l.*, the gift of the directors of the Agricultural Hall Company, was carried off by Mr. H. A. Major, a letter-carrier, for the best painting in oil in the exhibition. Mr. Dockree, of the civil service, was the successful competitor for the second best oil painting, the gift of Mr. C. Comfort, director of the Agricultural Hall. Miss Alice Haselden, aged 17, in addition to the silver medal, received a prize of 5*l.*, the gift of Mr. J. Harris, for the best water-colour drawing in the exhibition. In addition to silver medals two silver cups were awarded to A. M. Franklin, smith, of Bedford, for his model plough, this prize being given by the Messrs. Howard, the agricultural steam-engine manufacturers, of Bedford. A cup to Mr. W. H. Myers, printer, was for an invention in railway signals. Two bronze medals were awarded to Mr. E. J. Broughton, printer's reader of the *Bell's Life* and *Observer* office, for a bouquet of flowers made of wafers, and a carving in limewood. At the conclusion of the prize presentation, which occupied upwards of an hour, the framed and glazed representations of the opening ceremony were presented to the rest of the exhibitors,—1,200 or 1,400 in number, by the chairman. At the conclusion of this lengthy and tiring proceeding,

Mr. Beresford Hope addressed the assembly on the intimate connexion of labour with art. A table, he said, was in a certain sense as much connected with art as the painting of a picture. For a handicraftsman to despise art was to despise the means of making the most of the labour of his hands. There had been too much of the idea that workmanship was one thing and art another—that the workshop was the solid, practical thing, and that art was merely something pretty and beautiful—that the workmanship was the week-day clothes and that art was the Sunday. This was all a mistake—a fallacy. He contended that art meant good work, and that all good work was art.

THE ACCIDENT ON THE METROPOLITAN RAILWAY.

SIR,—In the transit and removal of heavy loads, every precaution suggested by an intelligent foresight, and tending to diminish the risk of accidents, should undoubtedly be adopted. It is deeply to be deplored that in this painful case no such foresight was exercised, and, consequently, no such precautions taken as might have averted the untoward disaster which resulted from so unfortunate a combination of circumstances. But it sometimes so falls out, that accidents and casualties will happen, in spite of all the studied plans and skilful arrangements which the mature experience of able men may devise. Unfortunately, in the case before us, even this plea cannot be urged in favour of those to whom the work of removal was intrusted, as not even the most ordinary care was taken to ward off and prevent the catastrophe which ensued, in consequence of such egregious neglect. At the same time, however, I am firmly convinced that it is quite within the range of possibility for the accident to have arisen in such a manner as, if proved, would go far to exonerate these men from the most serious charge of deliberate carelessness, and resolve it into one of want of judgment.

In your last week's impression may be found the following passage:—"It appears that no arrangement whatever existed for staying proceedings while a train was passing below, although the steam of the engine prevented the workmen from even seeing what they were about at the moment."

It is upon a careful perusal of this sentence that my opinion is based, the which I will endeavour to demonstrate as intelligibly as possible.

It appears from the evidence that it was found necessary to haul the girder one or two feet in order to bring it to its intended destination, and which might in the ordinary course of things have been done without any serious risk. Whilst this operation satisfactorily progressed the approach of a train was announced. According to superior orders signals were immediately transmitted to stop the engine. This was at once accomplished, but the immense tension on the connecting rope, generated by the traction of the engine and resistance of the load, unavoidably remained. Now, from this it occurs to me that the steam from the passing locomotive coming in contact with the rope, already strained to a very great degree, caused its contraction, thereby still more increasing its attractive tendency upon the girder. At the same time, the vapour of water impinging upon the latter acted as a lubricant, consequently diminishing the friction developed by the insistent pressure of the girder in question. It resulted from this aggregation of contingencies, in conjunction with the vibration caused by the moving vehicles, that the increased tension of the rope, and the decreased resistance of the girder, allured it beyond the insufficient margin allowed for safety, and caused it to cant over and topple into the cutting below, where the ill-fated train at that moment happened to be. The consideration of the fact that the girder descended after the primary portion of the train had passed, still stronger imbues my mind with the truth of the theory above enunciated; as, according to the doctrine of probabilities, there is more reason to conclude that it would have fallen either just previous to the arrival or subsequent to the departure of the line of carriages.

All the refined argument and cunning ratiocination in the world will not, however, extenuate censure of the executive for the lack of caution displayed in not employing some means to check the girder in case its progress should become too rapid, as actually occurred.

In conclusion, sir, I think you must concur with me that overhead work of this description ought not to be attempted during the regular traffic, unless, indeed, the intervals of time between the trains are rather considerable; so that no work should take place within, at least, a quarter of an hour of the arrival of each, in order that there might be ample time to give warning to the guard of the expected train in case of accident. S. W. WORSSAM, JUN.

WATER-PIPES IN HOSPITALS.

SIR,—I wish to draw the attention of builders and architects to the condition of the lead-piping in hospitals during the late cold weather.

I have just visited Yorkshire and Lancashire, where I saw some very fine recently constructed buildings. There were hardly any of them where the supply of water had not been partly interrupted. Lavatories and water-closets were in a lamentable condition for a day or two, the water being frozen up in the piping. I know quite well that the piping can and ought to be protected against the cold by covering or wrapping it up with hemp, flannel, or cloth; but could not greater care be taken of the pipes when the hospitals are constructed? The mischief done in private houses is bad enough, but in hospitals matters are worse. In those hospitals which are now in course of construction I hope better care will be taken to prevent freezing and leakage of the water-piping in cold weather. It must be simple enough to provide for it by properly placing and encasing the pipes. F. OPPERT, M.D.

THE REMOVAL OF SNOW.

As a heavy fall of snow in London streets causes not only considerable inconvenience, but serious expense and loss to the inhabitants, it is necessary that means should be provided for clearing the streets of the snow as it falls, or as soon after it has done falling as possible. This is, or should be, the duty of the local Boards and vestries, in whose care the streets are placed. The plan of carting away the snow to the Thames, or elsewhere, is far too slow and too expensive; I would, therefore, with your permission, propose a different scheme, as follows:—

Let snow-shafts be formed by the sides of the *main sewers*, from 200 ft. to 400 ft. apart, with water-tight tanks at bottom, and overflow doors discharging into the sewers. Let also moveable horizontal gratings be placed in the shafts, and strong roughed iron covers fixed flush with the streets. And near each shaft let a stand-pipe be set up, with screw nozzle, in which a length of hose, with a fan-spreader, may be screwed.

Immediately a *heavy* fall of snow occurs, let the officers of the Local Board and vestries collect a sufficient number of men, dust, slop, and rubbish carts, trucks and barrows, shovels and scrapers, and other appliances, and set them to work *in the chief thoroughfares;* some to open the snow-shaft covers and screw on the hose; some to scrape the snow into heaps; some to shovel it into the carts, or trucks, or barrows; some to tip and shovel it down the shafts, and direct streams of water on it by means of the hose, and some to assist the discharge into and along the sewers. The snow, if only partly melted, as washed into the sewers, would soon melt there, as the temperature of the sewage and the sewer air ranges from 70 deg. to 80 deg.; and the strong currents of water in the sewers would carry it away.

It is evident that, by this method, the chief streets of traffic could be not only quickly, but economically, cleared of the snow; and, in conclusion, I would observe, that at many places the gullies themselves might be used as snow-shafts, the snow being washed down them by the hose. JOHN PHILLIPS.

SINCE the above was in type we have received a communication from Mr. George Jennings (Stangate) suggesting that for the future any snow that may impede thoroughfares should be melted in chambers formed in accessible places, and warmed by hot-water pipes or melted over gullies in central situations by jets of steam from portable engines hired for the occasion.

HABITATIONS FOR THE METROPOLITAN POOR.

SIR,—I have read with great interest a report of the deputation to Lord Derby on this subject. It appears to me that some of the difficulties of legislating on the subject would be obviated if the Bill contained a preliminary clause providing "that upon any dwelling being judicially condemned, the owner should be compelled to pull it down, and then have liberty to rebuild it, conformably to the 'Act;' or failing that, then that he should be compelled to sell the land to the local authorities, who should be authorised and compelled to buy the site, the value to be fixed by mutual agreement, or by arbitration;"—the distinction being, between buying what the landlord calls a dwelling-house, and what the judicial condemners of it consider a vacant plot of ground,—a much more (as I conceive) equitable view of the matter. JUSTITIA.

RECORDS OF OUR BUILDINGS.

SIR,—Can there be anything more absurd and eccentric than the usual practice of hermetically sealing up written documents and coins of the realm under the foundation or corner stone of our buildings? secreting invaluable information for centuries, perhaps for ever, from the anxious inquirers that shall come after us, when a grand pile erected in this and subsequent periods, from age, may become a tottering ruin, with its walls here and there supported against the storm by the turning ivy, similar to many once noble buildings which have now almost vanished from us, and from the remains of which writers assume their date.

It seems to be very desirable and important that records should be carefully written, preserved, and handed down to the rising generation. Let them be written with an iron tool on polished granite, built on the inside of the edifice during the progress of the work, with its plan, section, and elevation laid down to scale engraved thereon, so that its history shall be read at a glance; and let those engaged in executing a noble work, in an age of advancement like the present, be it a cathedral, town-hall, mansion, or cottage, like the Assyrians of old, delineate on stone their handy works, which shall be read by all people and for all time. ONWARDS.

AN ARCHITECT'S STUDIES.

SIR,—At the last meeting of the Architectural Association, something was said of the course of study which students should pursue; several books were mentioned, the names of which I did not catch.

Many of us students have not parents who can afford to give them that long and expensive education which we should like,—and perhaps ought,—to have; and we should be most thank-

ful if you, and any other member of the profession who has fought through his freshmanship, would give us some advice as to what books to read, and in what order; what style to begin with, and how to progress; what places in England and abroad to visit, and how to go to work in the cheapest and most profitable manner; what courses of lectures they think necessary and best; and so on.

To study with system is the best—the only way to succeed in anything; and in a profession demanding so much and such varied study as ours a system is most necessary if we ever mean to get on. That we read the right books, that we study the right subjects and in their right order, is very necessary, and therefore we shall be much obliged by suggestions. We all have our own masters, whose advice we shall always be anxious to receive; but I venture to believe that "in the multitude of counsellors there is safety," and therefore hope that many architects will come forward to aid the rising generation.

BEGINNER.

THE DATE OF THE DEATH OF EDWARD NORGATE, THE ILLUMINATOR AND HERALD.

ALLOW me to thank my kind friend, Mr. Peter Cunningham, for his information respecting the will of Edward Norgate, the Clerk of the Signet, Herald, Illuminator of Royal Letters, and Manager of Royal Organs, in the time of Charles I.

Norgate is accused of having written a Tractate on Limning, which remains in manuscript at Oxford, after he was dead,—an unusual offence, the evidence of which lies of course in the proof of two facts; first, when he died; and, secondly, when the Tractate was written. Mr. Cunningham has established that Norgate was alive in 1649, and that he was dead in 1651. I make no doubt, therefore, that the date which Noble has given to his burial,—the 23rd of December, 1650,—will turn out to be correct. But nobody believes Noble, and therefore it was that I wished that the date given by him should be verified. Mr. Cunningham has partly done this in his very interesting letter; and if inquiries which I am making at Oxford should prove that the Tractate on Limning really was written by an Edward Norgate, and several years after the entry of the herald's will at Doctors' Commons, as given by Mr. Cunningham, all we can then say is, either that Norgate was guilty of the offence I have alluded to, or that the Tractate was written by some other person of that name, of whom hitherto we have known nothing,—perhaps by that very son of the herald whom Mr. Cunningham has brought to light, and who was his father's "greatest trouble."

An enrolment of the warrant which I communicated to *Notes and Queries*, proves that "*chaine* organ" should have been "*chaire*," that is, "*choir* organ."

JOHN BRUCE.

MASTERS AND MEN.

A CORRESPONDENT writes,—On the evening of Friday, the 11th inst., a trades-union meeting, interesting in comparison with the general attitude assumed between masters and men, took place at Crown Works, South Lambeth, the new premises of Mr. William Higgs, builder. About 600 men, wives, and children were entertained, and a testimonial, in shape of a timepiece, was presented to Mr. Higgs, as a mark of respect and esteem, from his clerks and foremen, and a few of his oldest hands. Various speeches were made, and the Rev. C. H. Spurgeon afterwards gave his lecture, entitled "Sermons in Candles."

LOCAL BOARDS AND SURVEYORS.

SIR,—The conduct of the Local Board of Health at Kingston-on-Thames, with regard to the election of their surveyor, will certainly, when made known, be a caution to gentlemen who seek such appointments as that of corporation engineer or surveyor. Some short time since the corporation of Kingston advertised for a "gentleman," of proper qualification, to fill the office of surveyor, and the result was no less than 127 applications. These applications and testimonials the Board went through the farce of referring to a committee for examination, and their conclusion was to invite the personal attendance of ten of, as the committee supposed, the best qualified gentlemen. What actually transpired relative to these gentlemen I know not, but at the last meeting of the Local Board, it was proposed and passed without any substantial dissent, that the person holding the office of collector should receive the extra amount of 20*l.* per annum for undertaking, in addition to his other duties, the functions of town surveyor.

Now, no one can doubt that out of so many applicants, at least one could have been found eligible for the appointment, and the irresistible conclusion is that there was no intention whatever to elect the best qualified of the candidates.

ONE OF THE "GENTLEMEN."

TENANTS' COMPENSATION.

A CORRESPONDENT of the *Star* calls attention to the manner in which the Metropolitan Board of Works are endeavouring to obtain possession of the various properties required under their Parliamentary powers. Being extensively engaged in conducting claims for compensations, he states his attention has been directed to this subject, owing to some clients—yearly tenants—on the line of the proposed new street to the Mansion House having been served with a six months' notice to quit by the Board of Works, who have purchased the landlords' interest. The case of one of them is a very hard one. He is a man who for many years has been labouring to establish a business, and has been at a considerable expense in adapting the premises, and his removal will entirely destroy his prospects. Yet the only answer received to an application requesting an appointment to consider his claim is "that the notice was given in due course, and vacant possession will be required when such notice has run out."

This is a question affecting some thousands of tradesmen and others who are subject to compulsory removal for the various railways and other public works in and around the metropolis, and it is to be hoped that some of our popular representatives will ventilate the subject on the re-opening of Parliament.

LIGHTING OF CHURCHES.

SIR,—I should like to see this subject treated in your journal. The mode of lighting one large room (whatever be its size), is simple enough, viz.,—by a series of coronæ symmetrically placed; but where the building consists of several compartments, if they may be called so,—as, for example, in the case of a church with chancel, nave, aisles, and west tower,—the question is not so easily solved: at any rate, architects propose plans which are open to obvious objections.

J. E.

DEFECTIVE SLATING.

SIR,—Can any of your correspondents advise as to any mode of treating slates from the outside to prevent the snow from drifting under the courses where it is impracticable to get at the underside to "torch" them, the rafters being ceiled on the inside?

A VICTIM.

THE NATIONAL GALLERY.

SIR,—"*There are merits in the present building of the National Gallery.*" These words in your last number cannot be too well remembered, nor too largely insisted upon. It is most gratifying to read them where they stand. Wilkins could not have designed a bad building, or one inappropriate to its situation. Whatever the present edifice exhibits of shortcomings was not due to any want of capacity in the architect, but to a failure of the funds for finishing it as intended. The National Gallery has never yet received its proper completion. If I mistake not, when first we got it the public, to say nothing of the profession, were pleased with it; and, on one occasion, at least, the word *splendid* was applied to it. The nation did not discover that it was undeserving of its position and purpose, though the trick played off upon us by the Royal Academy was enough to disgust everybody but themselves. The cry raised a few years after against the façade, that it was utterly unworthy of a National Gallery, was a trick devised by the enemy for a special purpose. There was nothing then said of pulling it down, for that was foreign to the intent, and would have defeated the object in view, which was that the Royal Academy might obtain the whole of it. Subsequently, however, the cry of "Down with it! down with it!" was set up by those who were convinced, like John Knox in the olden time, that the only way to get rid of the rooks was to pull down their nests. It is devoutly to be hoped that the gentlemen rooks will go away quietly, without bringing the whole building about their ears. It would be a wicked folly to demolish the National Gallery for being somewhat unfinished, and before we have given it a fair trial, simply because an interested party has decried it down, and a foolish multitude has believed them.

Besides the serious objections to such a vandalism, which must suggest themselves to every one who considers the subject, there are positive reasons for letting it remain, some few alterations and additions being made to the frontage, and extra galleries provided as circumstances may require.

The building, though still in its juvenile days, has already become historical; we like to see its dear familiar face, and most of us have invested more or less of our affections in it. It suits the situation admirably, and is in harmony with its surroundings. There are points of view in which it is seen to much advantage. The effect, looking from Pall-mall East, with Gibbs's church beyond, forms an architectural vista scarcely surpassed by any edifice in London. The general impression produced by the new designs now on view, tends greatly to confirm the desirability of retaining what we have got.

These new designs, no doubt, display a vast amount of talent, taste, and imagination. The merits of some may justly be described as *stupendous*: at the same time it must be confessed, that however some may be suited to the situation, others are decidedly not. There is such a requirement in architecture as propriety, which many elements, not essentially architectural, help to make up. A due deference should be shown to the *dii loci*. A dream of St. Mark's, with its companion campanile, is not exactly the sort of thing to set down in the *grande place*, the capitol, so to speak, of our British metropolis. Neither do we desire, in these days of progress, to be carried, even in imagination, back to Mediæval London, with all its associations. In looking at these new designs, it is not difficult, methinks, to point out some of their sources of inspiration. The uninstructed public can find out, well enough, likenesses to St. Paul's and the Bank. The Baptistery at Pisa, certain buildings at Bologna, the Lombard architecture of Northern Italy, and the new gallery at Dresden, would seem to have suggested various features; while other inspirations appear to have been derived from nearer home, from Paris, with its Pantheon, its Luxembourg, its Louvre, and Le Val de Grace. Admirable as all these may be, showing what may be done, at least upon paper, there are other designs which are more to our purpose, showing how the best abused building in London might easily be restored to favour and made one of the greatest ornaments to our metropolis. A tenth part, or less, of the decorations bestowed on some of these new designs would make it *splendid*, after all. We have only to remove the "pepper-boxes," and replace them with such ornamental structures as Mr. Barry has suggested, and to raise, and enlarge, and beautify, the dome in the centre, as suggested by another set of designs. With these, and a generous, though not extravagant, distribution of figures, bassi-relievi, and urns, we shall get just what we want,—an elegant and classical building, indicative of its purpose, and of the good sense of our rulers in not pulling down in one generation what, with care and cost, had been raised in the previous one; and we shall thus escape being made the laughing-stock of Europe, as if we were little children, who never knew what we wanted.

H. C. BARLOW, M.D.

MORE KITCHEN-BOILER ACCIDENTS IN THE NORTH.

AN inquest has been recently held at Preston on the body of a woman named Shaw. The deceased lived in Back Sydney-street, and on the previous day she went to clean the cellar kitchen of an unoccupied house in Stanley-place. She set a fire in the grate, and some time afterwards the kitchen boiler exploded with a loud noise. She was badly scalded, and had one of her legs broken. A police officer and others conveyed her to the House of Recovery, where she died in a few hours. The boiler which exploded was constructed on the self-feeding principle, and it is supposed that the pipes had got closed up through the frost. A verdict of "Accidental death" was returned.——A sad accident has also occurred at Alton Albany mansion-house, Ayr. In consequence of the intense frost, the water froze in the pipe leading up to a cistern connected with a kitchen boiler, and hot water could not be got. In ignorance of the danger the fire was lighted, steam was generated in the boiler, and a sudden explosion took place. A boy was blown against the opposite wall, and killed on the spot; two other children who were in the kitchen were severely scalded; and the mother of the children (a coachman's wife) was also much injured. Part of the boiler was projected, as from a cannon, through the retaining wall, about 30 ft., into the library.——We must again warn our readers of the risk attendant on the careless use of kitchen boilers at this season.

METROPOLITAN BOARD OF WORKS.

AT the last weekly meeting, eleven tenders were received and opened for the construction of works required for the diversion of the Limekiln Dock, and Blackwall sewers, High-street, &c. A committee of the whole Board, after examination of the tenders, recommended that the tender of Mr. Webster for 20,000*l.* should be accepted, subject to the usual inquiries.

On the motion for the adoption of the report being made, an amendment was moved that the tender of Mr. Ritson for 18,500*l.* should be accepted.

For the amendment	5
Against	22
Majority against the amendment...	17

The report was adopted, and the tender of Mr. Webster accordingly accepted on the usual terms.

SKATERS' FOLLIES.—Something must be done to "put down" suicide by skating. Persons should not be allowed to distress their friends and otherwise derange the relationships of society, sometimes pauperizing their families and throwing the burden of them on the public, by their own destruction through an insane and unreasoning love of sliding along. It should be made a criminal offence to go on to public ice certified to be unsafe. The fear of three months with hard labour might deter many who would not be kept off by the chance of losing their life.

THE ARCHITECTURAL ASSOCIATION.

THE usual meeting of members was held on Friday evening, the 4th inst., at the House, in Conduit-street, the president, Mr. R. W. Edis, in the chair.*

Mr. Lacy W. Ridge read a paper "On the Influence which the Architecture of the Past should have at the Present Time." Having remarked upon the persistent manner in which we constantly recurred to the past for copies until, in the nineteenth century, a heathen temple (the Parthenon), no bigger than the church of St. Martin's-in-the-Fields, was still regarded as the model of art, and glanced at the works of Inigo Jones, Sir Christopher Wren, Chambers, and others, Mr. Ridge commented upon the marvellous change which the genius of Pugin had wrought in the public taste, and the impetus which he had given to Gothic art; and observed that, in his opinion, one of the great evils of the present day was, that architects looked too much to the examples of the past without reference to the materials with which they had to deal. He recommended the students of architecture to endeavour to rise above the level of mere copyists of ancient works; and, instead of going back to the remote antiquity of Greece and Rome, to study the architecture of the North-west of Europe from the eleventh to the thirteenth century. The propositions which he ventured to submit as a solution of the problem involved in the question which he had raised, were—first, that the architecture of the past ought not to influence the plan and arrangement of our buildings; secondly, that the architecture of the past ought not to influence the construction of our buildings, when inconsistent with the materials of the present; thirdly, that the architecture of the past ought not to influence the mode of executing utilitarian details so as to interfere with their usefulness; fourthly, that the architecture of all good styles should have great influence in educating the mind of the architect in outline proportion, and all the principles of design; and, fifthly, that the details of our buildings should be in accordance with the style in which the architect works, although the general inspiration be drawn from another style.

Mr. Blashill having expressed approval of much that had fallen from Mr. Ridge, remarked that he did not think blame could fairly attach to architects who might have two important works in totally different styles going on at the same time; because, although an architect might have a speciality for Classic as against Gothic, or for Gothic as against Classic, he would not be justified in refusing a commission for that one which might happen not to be his favourite study. The success of the great monuments of art bequeathed to us by our ancestors of monastic times, was, no doubt, to be attributed to two causes. The first, that the monks thoroughly understood good architecture; and the second, that they were not controlled in the matter of time and expenditure by clients. The only way, in his opinion, to get a new style, would be to avoid servile copies of the past, and to take a thoroughly practical view of the work which they were actually engaged to carry out.

Mr. Phené Spiers thought that the great evils of the present day were that students of architecture did not study from old works, but from those of their masters, or of professors; that they were more inclined to design than to obtain a thorough knowledge of construction; and that they looked out too soon for remuneration for their work before they gave themselves time to study. He would be glad to see a system introduced into England similar to that which prevailed on the Continent, namely, that the student should begin by a careful examination of the best examples of the old masters. He would commence with the study of Classic architecture, so as to ascertain the principles upon which the old masters worked. After that he would begin Gothic, and take for his special study the Early English style, than which no better examples could be found than in our magnificent cathedrals. After this he would begin to design, always bearing in mind that he would have to adapt his designs to the requirements of the present day. One of the great difficulties with which the architects of the present day had to combat was involved in the matter of contracts. In olden times our great cathedrals were built by degrees. The works extended over many years,—twenty, thirty, even fifty or sixty; and the architect was thus enabled to avail himself of all the improvements which time and progress might develop. Now, however, no matter what might be the magnitude of the work, the architect was bound down by inflexible contracts, which shut him out from those advantages which his predecessors in olden times were enabled to enjoy. As an illustration, he might state that he believed Mr. Woodward had scarcely got his new building at Oxford 2 ft. above the ground, before he wished heartily to be able to remodel the whole of it.

* The following gentlemen were elected members of the Association: Mr. Chas. Moxon, Mr. Williams, Mr. H. Jeckell, Mr. Turner, Mr. Bainbridge, Mr. H. Jackiers, Mr. Seare, and Mr. Parkon.

After some discussion, in which Mr. Potter, Mr. Tarver, and other gentlemen took part,

The Chairman, in putting a vote of thanks to Mr. Ridge, observed that he thought too much had been said and written about the absolute necessity of copying old examples. He saw no more reason why we should do so in respect to architecture than that we should go back to the very primitive attire of the earliest period, and take to fig-leaves and bear-skins as items of apparel. The study of the works of ancient times was valuable, no doubt, in an educational sense, but he deprecated that sort of professional instruction which led to servile copies instead of original ideas. Neither could he agree with those who held that "Gothic men" were higher in the scale of fame than "Classic men." The object of education and travel was to enlarge the mind and expand the intellect, to imbibe original inspiration, and not to copy, but to emulate the greatness of those who had gone before us. With regard to the paper read by Mr. Ridge, he considered that gentleman was entitled to credit for having grappled with a subject which other members of the Association had hesitated to undertake, even for a prize.

Books Received.

VARIORUM.

"THE Prince of the Fair Family," by Mrs. S. C. Hall, published by Chapman & Hall, is a charming quaint story, told with all the author's usual grace and purity of feeling. It will interest and delight others besides the little people to whom it is more especially addressed. The greater number of the illustrations are by the veteran Kenny Meadows, whose hand (we might say, literally, for that important member is a favourite object of illustration with him), appears throughout the book, and Mr. Walter Allen. Mr. and Mrs. E. M. Ward, and Mr. Noel Paton also co-operate effectively; and the result is a book that may be most safely recommended.——The "Emblems" of Francis Quarles gives pleasure to only a certain number of persons, but no one can dip into it without profit, and few books of its class have been more often reprinted or imitated. None of his imitators have equalled him, much less surpassed him. The new edition, published by Tegg, "Emblems Divine and Moral," is well got up, and soundly bound, and will doubtless command the same steady sale that has followed other issues of the Hieroglyphics of the Life of Man.

Miscellanea.

RIVER STEAMERS CUTTING THROUGH SAND-BANKS.—It is said that a Prussian engineer has made an invention by which steamers on rivers can cut through or cast aside sandbanks. The invention is not described; but if it does what is said, it will be very useful in many countries, especially on the Continent, where rivers navigated by steamers are frequently obstructed with sandbanks. Might not a machine for deepening rivers be constructed upon some such principle?

"THE PARLOUR STEAM-ENGINE."—The toy issued under this title by the Stereoscopic Company is calculated to be very serviceable to boys and girls, and may be made the means of conveying to them knowledge as to the rarefaction of air by heat, the pressure of air, centrifugal force, and other scientific phenomena. Moreover, it pleases while it instructs. Although from its name some may expect to find the little machine in a different shape from what it has, it is in truth a reproduction of the first known engine in which motion was produced by steam, that of Hiero, invented, if we remember rightly, some 400 years before the Christian era. We do not observe that this has elsewhere been pointed out.

THE NEW OIL TRADE OF NORTH STAFFORDSHIRE.—A new and very extensive field of industry has recently been opened up in North Staffordshire, under Young's process for extracting oil from cannel coal, the common shale of North Staffordshire possessing similar properties. This shale abounds in millions of tons near the North Staffordshire ironstone seams, and has hitherto been considered as worthless refuse, a premium having been frequently paid by colliery proprietors for its removal. Young's patent has expired, and nearly 100 tuns of crude oil are now being produced every week within a short distance from Burslem and Tunstall, though, as compared with its future magnitude, the trade can scarcely be said to have begun. Refining works have been opened. They have been built at a cost of 12,000*l.*, midway between the Burslem and Tunstall stations.

EFFECT OF COLD.—The Registrar General's return says,—The effects of the cold are now visible in the returns, for instead of 1,436, and 1,437 deaths, as in the two preceding weeks, there appear on the registers of last week 1,891 deaths. The change of temperature has killed about 455 people in London. Few were directly frozen to death; the majority having vital force enough to struggle against the freezing cold, but not enough to prevent them from succumbing under bronchitis and other affections.

MAKING AND TAKING.—Recently, commenting on an assertion that the iron-trade was leaving us, the *Examiner* quoted, against such a belief, a statement of facts as from the *Mining Journal*. Thereupon the *Birmingham Daily Post* remarked,—"The quotation here given as from the *Mining Journal* was taken by that paper from our own leading columns, word for word, without acknowledgment." On which, down comes the *Iron Trade Circular* with,—"The editor of the *Birmingham Daily Post* has omitted to mention that he took his facts and figures from us, and we may as well say that ours were supplied to us by the *Economist*." Something of the same kind has happened with a paragraph of our own, as to the importation of joiners' work from abroad, with which paragraph, quoted, by the way, as "from a London paper," the walls of two or three provincial towns, we are told, are now placarded.

VICTORIA STATION AND PIMLICO RAILWAY COMPANY.—The report read at the ordinary half-yearly meeting of this company stated that the revenue account for the six months ending December 31, admits of the payment of the same dividend as that of last half-year—namely, 3¾ per cent., or at the rate of 7½ per cent. per annum; and that the very large outlay recently incurred by the Brighton, Great Western, and London, Chatham, and Dover Companies, in making the new approaches to the Victoria Station, both north and south of the Thames, and in widening the bridge, and the approaching connexion of the Victoria Station with a station of the Metropolitan District Railway, are calculated to place the maximum aggregate rental of 33,125*l.* (which commences on and from the 1st of April next) in the highest class of freehold ground-rents. The report was adopted, and a dividend of 3¾ per cent. for the half-year declared.

A ROMANCE OF THE NEW YORK SEWERS.—A strange story of "untold treasures" having been found by a young girl and two companions in the New York sewers, is related by a correspondent of an American paper. The result of a week's search is roughly estimated at 1,500,000 dollars, in realizable value, of jewelry and other treasures. "A bushel" of jewelry contained diamond rings worth some thousands of dollars each. One plain gold ring was inscribed in Dutch,—"Peter Stuyvesant to his Wife." Altogether, however, the story has an air of improbability about it; and if it were true, the New York sewers must be *managed* in a totally different way from those of London. "Miss Walker (who took the hint from an old newspaper) and her brother, who find themselves thus lifted suddenly from penury to great wealth, intend to proceed to England, where they have relatives," and where they will no doubt visit the London sewers, and report wonderful progress in the New York papers!

THE ART STUDIO OF MESSRS. RANDEL, JEWELLERS, BIRMINGHAM.—Nearly a year ago we recorded the praiseworthy example set by Messrs. Randel, goldsmiths and jewellers, Vittoria-street, Birmingham, in erecting a spacious and well-appointed studio for the promotion of gratuitous art-education amongst their workmen and apprentices. The result, it appears, is a decided success. The whole scheme has been organized and superintended by Mr. J. J. Allen, sculptor, who is the designer and superintendent of art-works to the firm. Prizes, consisting of books (given by the editor of the *Art-Journal*), colour boxes, and other appropriate articles, were lately distributed to the most deserving of the pupils, whose art-works were exhibited at a meeting for the purpose, attended by a considerable number of workpeople and other invited guests, who partook of a cold collation in the studio. Mr. Randel presided, and the mayor and various other gentlemen interested in art were present. The average attendance at the school is about forty-five nightly for two nights weekly. The firm compel every apprentice to learn drawing on the work

STEAM IN VENICE.—It is proposed to organize a service of steam gondolas on the canals of Venice. The lovers of the picturesque think this a desecration, and the gondoliers are equally indignant, from less disinterested motives.

MUSEUM OF PRACTICAL GEOLOGY.—This museum has been lighted up at night, and the Lords of the Committee of Council on Education have ordered that in future the museum shall be open to the public on the evenings of Monday and Saturday in every week. The throwing open for the inspection of the working people of the metropolis of an interesting and instructive museum such as this, at the only time at their disposal, is a boon which, when properly known, will, no doubt, be extensively availed of.

COAL IN SHROPSHIRE.—The works in connexion with the sinking of a pair of shafts in the reputed dead ground at Prior's Lee, the successful issue of which has opened up a new coal-field, are now complete, the miners having reached the "clod coal," the ultimate stratum of the bed. The original estimate of the yield from this mine is fully confirmed by the working, and it is computed to contain upwards of 10,000,000 tons of coal. The shafts have been named the Granville Pits, in compliment to Earl Granville, one of the principal partners in the Lilleshall Company, who are working the mine.

DISCUSSIONS AT THE SOCIETY OF ARTS.—The council have decided to set apart the first Wednesday in each month, during the present session, for the discussion of various questions connected with Arts, Manufactures, and Commerce: these discussions may commence either with or without the reading of a paper. On the evening of Wednesday, the 6th of February, Mr. Henry Cole, C.B., will introduce the following subject:—

"On the existing legal regulations in reference to the Cab Fares in the Metropolis, and their effect in rendering the Vehicles inferior to those provided in other European Capitals and the large Municipal Towns of this Country."

THE RAILING ROUND ST. PAUL'S.—The Commissioners of Sewers have recently appointed a deputation to wait on the Dean of St. Paul's, for the purpose of endeavouring to have the railing of the churchyard set back, so as to widen the thoroughfare surrounding the cathedral, and a correspondent thinks the present a favourable time to suggest the removal of the railing altogether. He does not seem to be aware that this is a subject which has been repeatedly mooted in the *Builder* already. We would not wish the railing altogether removed, or at least the space thrown altogether open, but we think, as we have all along done, that a re-arrangement should be made, and a portion of the space thrown into the roadway, where it is most needed.

GROWING COLOURED WOODS.—We hear of an invention by Mr. Hyett to make trees imbibe colour while growing. The results were exhibited lately at the *conversazione* of the Cirencester Royal Agricultural College, in the form of sections and planchettes of wood, stained with various hues. Metallic salts are introduced into the substance of the growing tree, apparently carried up by the sap, and forced into the fibre and cells of the stem. It is not said what metallic salts are used as dyes. The idea reminds us of some curious experiments recorded, though not the same, in the *Builder* many years since, in which dahlias were varied in colour by means of substances such as charcoal imbedded with the bulbs in the soil. We think, too, we have heard of colours being infused into dead woods under exhausted receivers.

LONDON ASSOCIATION OF FOREMEN ENGINEERS. The fourteenth annual meeting of the members of this society took place on the evening of the 5th instant, at their rooms in Doctors' Commons, City. The assembly-room, notwithstanding the exceptional inclemency of the weather on the occasion, was crowded. The sitting was devoted to the election of six or seven new members, the reception of the previous half-year's audit of accounts, the annual address of the president (Mr. Joseph Newton), the election of officers for 1867, and the completion of arrangements for the anniversary festival of the institution, appointed for the 16th of February. Mr. Newton was re-elected with acclamation. Mr. Keyte was chosen vice-president; and Messrs. Danson, Edmonds, and Irvine, jun., committee-men. We understand that this society now numbers 160 members, and that it has a balance of 1,200*l.* at its banker's.

"CENTRAL COTTAGE IMPROVEMENT SOCIETY."—Competitors are complaining that the results of the competition have never been properly made known, and that they cannot get back their designs.

BRIDLINGTON HARBOUR.—A considerable improvement by the extension of the north pier has been effected in this harbour, which until recently was very unquiet in gales of wind from certain quarters of the compass. The new works have been executed from the design of Mr. John Coole, C.E.; the contractors being Messrs. Simon & Thomas Crawshaw, of Askham Bryan, near York. In addition to the quieting effect of the new pier extension, there are 4½ ft. more water at the entrance than previously. The additional depth has been gained without any expenditure in dredging.

NORTHERN ARCHITECTURAL ASSOCIATION.—The eighth annual meeting of the Northern Architectural Association was held on Tuesday, the 8th inst., in the Old Castle, Newcastle, Mr. J. Johnston, vice-president, in the chair. Mr. M. Dunn, in the absence of the secretary, read the annual report of the committee, which stated that there had been an increase of members and associates during the year. After meeting all expenses there remained a balance in hand. The vice-president read a paper, in which he reviewed the past history of the association, its present position, and its prospects for the future.

EXPLORATIONS IN THE NORTH.—The late Mr. Rhind bequeathed 400*l.* to the Society of Antiquaries of Scotland, for the archæological exploration of a rich field of antiquities *in the upland districts* of the counties of Caithness, Sutherland, and Ross. The secretary of the society, Mr. Stuart, has lately examined the districts, and he finds that around Wick especially there is an accumulation of important remains not to be found elsewhere. The objects referred to comprehend,—1. Picts' castles, variously called round towers or brochs; 2. Eirde-houses, or weems, which at times are double; 3. Circular hut foundations, with and without an underground chamber; 4. Groups of small cairns, frequently in connexion with the hut-foundations; 5. Large cairns, long, circular, oval, and "horned," with one or more central chambers or galleries; 6. Standing-stones, single and in circle; 7. Rows of standing-stones radiating from cairns; 8. Rows of standing-stones without any apparent connexion with cairns; 9. Hill-forts of stone ramparts; 10. Hill-forts of vitrified stones; 11. Stones and boulders with cup and ring [or concentric circled ?] markings. Mr. Stuart recommends a certain course to be followed in the investigation, and it is probable the Society will forthwith authorise the thorough exploration of these interesting remains.

COMMUNICATIONS BETWEEN PASSENGERS AND GUARDS.—Notwithstanding the multiplicity of plans and the fact that it is not from want of such plans that railway authorities are slow to adopt means of communication between passengers and guards, still invention is at work in devising plans; but perhaps one of the oddest is that now under notice. A number of railway directors and gentlemen connected with mechanical science have just been attending a series of experiments with it made on trains running between Victoria Station and the Crystal Palace. The apparatus is applied to a carriage, or any number of carriages, by simply drilling a hole in the roof. A tube, having a slight slit in it is then in reach of the passenger. In the slit is a pair of jams or jaws, covered with a chemical composition of an ignitable character, but which can only be ignited by the touch of another composition having affinity to it. This second composition is to be supplied by touching the passengers' tickets with it, and the insertion of a ticket will at once explode a rocket! which can be heard from end to end of the train, and ignite coloured fire, which will flare up for several minutes on the roof of the carriage, so pointing out where the explosion came from. The passenger's ticket will show who caused the explosion. The exploded rocket, one would think, or its vacant place, rather, would also speak for itself. Of this lucifer ticket, might we suggest, that since that is the ticket for safety (?) it might contain also a life assurance security, so that should the passenger fail in securing his life, it would at least be insured for behoof of his heirs, should the rocket explosions lead to fatal accident, such as by delay of the train or otherwise.

THE ROADS.—In Kensington and Brompton, during the frosty weather, the roads have been, and are being, well sprinkled with sand early in the morning, by means of which much inconvenience and suffering have been avoided. We give credit alike to Mr. Broadbridge, the parish surveyor, and the vestry under whom he acts.

MEMORIAL OF LORD PALMERSTON.—It has been decided by the committee that the memorial of Lord Palmerston shall be the putting in of a stained-glass window at the west end of Romsey Church, and if the funds are sufficient, the east window also; and that a statue shall be erected in the Market-place of the town. The latter is to be placed entirely in the hands of the Hon. Wm. Cowper to carry out.

THE CROYDON FIRE.—It has been resolved to call a public vestry of the parishioners, in order to consult them as to what is to be done as to Croydon Church. The general opinion is, that the remaining walls and tower are so calcined by the intense heat that it will be better to clear the ground, and have an entirely new church. There can now, it seems, be no doubt that the fire was occasioned by the over-heating of the Gurney stove at the south-west corner of the church.

TENDERS

For the erection of casual wards, at St. Marylebone Workhouse. Mr. H. Saxon Snell, architect. Quantities supplied:—

Ebbs & Sons	£1,347 0 0
Brown	1,316 0 0
Nightingale	1,263 0 0
Hall	1,253 0 0
Kelly	1,243 0 0
Rigby	1,193 0 0
Sabey	1,176 0 0
Potter & Sons	1,130 0 0
Shaw	1,117 0 0
Crabb & Vaughan	1,083 0 0

For building St. Matthew's Church, New Kent-road. Mr. Henry Jarvis, architect:—

	Church.	Spire.
Patman & Fotheringham	£7,276 ...	£680
Thompson	6,560 ...	670
Gammon	6,370 ...	605
Dove, Brothers	6,355 ...	520
Henshaw	6,184 ...	728
Myers & Son*	6,075 ...	530
Higgs	5,265 ...	518

* Mr. Higgs having made a mistake, Messrs. Myers & Son's tender being the next lowest, was accepted.

For villa residence in the Seven Sisters-road, for Mr. H. Taylor. Mr. William Smith, architect:—

Macfarlane	£1,680 0 0
East	1,665 0 0
Grover	1,648 0 0
King	1,640 0 0
Johnson	1,625 0 0
Crabb & Vaughan (accepted)	1,589 0 0
Dimsdale	1,540 0 0
Blanch	1,123 0 0

For alterations to 164, Fenchurch-street. Messrs. John Young & Son, architects:—

Chessum	£1,395 0 0
Ashby & Horner	1,350 0 0
Henshaw	1,263 0 0
Webb & Sons	1,245 0 0

For the erection of two warehouses in Aldermanbury, for Mr. Meyerstein. Mr. T. C. Clarke, architect. Quantities by Messrs. Hovenden & Heath:—

Scrivener & White	£7,183 0 0
Hill & Sons	7,167 0 0
Macey	7,159 0 0
Patman & Fotheringham	6,789 0 0
Newman & Mann	6,371 0 0
Kilby	6,310 0 0
Henshaw	6,196 0 0
Conder	6,117 0 0
King & Sons	6,098 0 0
Browne & Robinson	5,974 0 0

For alterations and additions to premises, 85, City-road. Mr. Thomas J. Hill, architect:—

Bishop	£390 0 0
Perry	312 0 0
Anley	303 0 0
Sabey	294 0 0

For alterations and additions to No. 231, Upper-street, Islington, for Miss Tubbs. Mr. William Smith, architect. No quantities supplied:—

Waters	£755 0 0
Sabey	495 0 0
Macfarlane	450 0 0
Hunt	360 0 0
Cubitt	232 0 0

For alterations at No. 20, Kensington Park-terrace, Bayswater. Messrs. Bird & Walters, architects:—

Huggett & Hussey	£501 15 0
Newman & Mann	379 0 0
Brown	350 0 0
Williams & Son	347 0 0
Kelly, Brothers	337 0 0

For alterations to the Sun Tavern, Ranelagh-street, Pimlico. Messrs. Bird & Walters, architects:—

Henshaw	£647 0 0
Ebbs & Sons	589 0 0
Williams & Son	567 0 0
Brown	549 0 0
Newman & Mann	539 0 0
McLachlan	510 0 0